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CONTENTS.

Original Communications.

The Importance of Recognizing the Vaso-motor System as a Factor in Disease in the Treatment of Circulatory Disorders. By H. A. Hare, M.D 145
The Treatment of Cancer and Sarcoma by Forced Alimentation and the Use of the Toxin of Erysipelas. By B. H. Detwiler, M.D 149
The Treatment of Typhoid Fever by Cold Applied to the Abdomen. By A. J. Downes, M.D 151
The History of the Course and Treatment of Four Cases of Typhoid Fever. By R. B. Watson, M.D 154
The So-called Intestinal Indigestion. By W. S. Christopher, M.D 156

Leading Articles.

Veratrum Viride in Puerperal Eclampsia 159
The Treatment of Typhoid Fever ... 160
Calculous Anuria 160

Reports on Therapeutic Progress.

Alumnol in Gonorrhea 158
On the Therapeutic Employment of the Supra-renal Glands 162
Climatic Treatment 166
Diseases of the Anus 167
The Kind of Cervix that Requires Trachelorrhaphy 170
Mercury in Heart Disease 172
Hemorrhage after Removal of the Tonsils 174
Absorption from the Bladder, Urethra, and Vagina 174
Treatment of Acute Sepsis occurring after Labor and Abortions, to Prevent its Extension, or from Causing Permanent Injury 176
Studies in Anesthesia and Anesthetics 178
The Formation of Blood from Inorganic Iron 178
Rhus Poisoning 180
Lupus Erythematosus Treated Internally with Phosphorus 180
The Pharmacology of the Ipecacuanha Alkaloids 181
Gastric Lavage with a Continuous Current 182
Antipyrin and Tannic Acid as a Styptic 183
Treatment of Tetanus by Antitoxin. 184
The Operative Treatment of the Diseases of the Antrum of Highmore. 185
Diagnosis and Treatment of Fractures of the Upper Third of the Femur, including the Neck 187
Accessible Surgical Tuberculosis 189
Peritoneal Irrigation and Drainage .. 190
Three Successful Cases of Splenectomy 190
Seven Cases of Amputation of the Hip-joint 191
Pelvic Abscess Treated by Incision and Drainage 191
Treatment of Laryngeal Tuberculosis 193
Some Points in the Practice of Lithotrity or Litholapaxy 194
The Infiltration Method of Anesthesia (Schleich's) 195
Radical Cure of Hernia 196
Cancer of the Rectum 197
Rupture of the Pancreas 198
The Treatment of Soft Chancre 200
Operation for the Radical Cure of Hydrocele by Excision of the Sac .. 200
Notes on Retention of Urine from Urethral Stricture 203
Why is the Abdomen Opened in the Middle Line? 204
Treatment of Malignant Tumor 205

Reviews 206

Correspondence.

London Letter 208, 211
Paris 214
Treatment of Persistent Vomiting of Pregnancy 216

Notes and Queries.

Vivisection 216
What Constitutes a Normal Antitoxic Unit? 216

Original Communications.

*THE IMPORTANCE OF RECOGNIZING THE VASO-MOTOR SYSTEM AS A FACTOR IN DISEASE IN THE TREATMENT OF CIRCULATORY DISORDERS.**

BY H. A. HARE, M.D.,
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I have chosen the title heading this paper because I am convinced that the importance of considering the condition of the vaso-motor system in disease is not appreciated. Either it is ignored entirely, or it is spoken of indefinitely in much the same way that some practitioners refer to the sympathetic system as a cause of an ailment, probably because it is the simplest way of admitting that they don't know what they are talking about. In reality we may, in view of our knowledge of the functions of the vaso-motor system, assert that its integrity is as necessary to life as is the integrity of the heart—the organ to which we pay so much attention in every case we see. A heart may be lamed, yet the man live comfortably, whereas an ill-conditioned vaso-motor system will at once cause distress. This system is made up on the one hand of the vaso-motor nervous apparatus, and on the other of the blood-vessels themselves.

* A paper read before the Delaware County Medical Society, at Chester, Pennsylvania.

It is to be remembered that the tonicity of the arterioles and capillaries offers a resistance to the action of the heart which is as natural as is the atmospheric pressure of fifteen pounds to the square inch on our bodies or in our lungs, and that any variation in this resistance by reason of dilatation or contraction of the blood-vessels is followed by as definite symptoms as ensue when we expose ourselves to rarefied air on the one hand or to compressed air on the other. The resistance offered to the heart by the properly acting vaso-motor nervous system, through its influence on the vessels, is identical with the friction offered to the driving wheels of a locomotive. The locomotive is meant to meet and stand this resistance, and if the resistance is removed by slippery rails the wheels fly around ineffectually, racking the machinery and destroying its usefulness. On the other hand, if the hill be too steep, the resistance is too great and the engine comes to a standstill or blows out a cylinder-head, though before such a thing occurs the mechanism is much embarrassed, as is evidenced by the heaving impulses of the draught.

From this we learn some important diagnostic and therapeutic facts: first, that a rapid pulse may be due in no way to a disordered heart, but be due to vaso-motor relaxation; and second, that the proper way of treating this rapid pulse is to put sand on the track and increase the resistance, and not to make more steam—or give digitalis—which will only make the engine, or heart, work away on slippery rails with more wear and tear and make no progress.

Conversely, if a heart seems to be laboring against a high arterial pressure, the most sensible thing for us to do is not to stimulate this organ to increased and exhausting effort, but to eliminate the resistance offered by the grade, by making a cut, through which the heart may pump its way with normal resistance. This we do by the use of vaso-motor relaxants, such as the nitrites, or by bleeding. Much of the reputation of nitroglycerin as a cardiac stimulant rests on the fact that under its influence excessive arterial resistance is removed and the heart has a chance to perform its work properly without direct stimulation.

When we consider the enormous space offered by the capillary area when it is relaxed, for the flow of blood or its stagnation, the facts I am endeavoring to emphasize become even more impressive.

It seems proper, therefore, that in every case to which we are called for heart trouble we should examine the tension of the blood-vessels before prescribing for the heart itself.

Let us take for study severally conditions familiar to us all, in which the heart is in reality intact and the vaso-motor system really at fault, yet in which the heart usually gets the credit for the trouble. The most frequent of these is ordinary shock, in which, after the early inhibition of the heart by the irritated vagus (a state we rarely see, because we do not see the patient soon enough), the entire group of symptoms indicates vaso-motor relaxation in the soft radial pulse, the cold, wet, leaky skin, and the bloodless surface. Under these circumstances the heart beats fast and abortively to fill the yawning blood-paths, which have many times the area it is capable of filling, and soon fails from exhaustion.

Again, we frequently see attacks of tachycardia in which the heart, though strong and able, beats with excessive rapidity, resistance having been suddenly removed by vaso-motor relaxation, as shown by the tension of the pulse. Frequently in nervous, hysterical women, sudden flushings or vaso-motor palsies produce tachycardia.

Another state more like that of shock than those just named is the vaso-motor relaxation of advanced acute diseases, such as typhoid fever or pneumonia, particularly the latter. Every one of my hearers must have seen cases of pneumonia in which after the crisis there developed a rapid running pulse with collapse and profuse sweating, with gasping breathing. Undoubtedly this state is partly due to the heart being exhausted by its work, and the loss of its stimulation caused by fever, but a large part of the symptoms are really due to the vaso-motor relaxation.

Another evidence of general or local vaso-motor relaxation is to be found in certain types of what has been called functional albuminuria, in which there is relaxation of the renal vessels so that they become engorged with blood and "leak albumin," to use a common phrase. Sometimes this state is due to heart-failure, but often to vascular atony.

Last of all we find more localized vascular atonies, such as are seen in certain cases of pelvic, respiratory or bronchial attacks of congestion or hyperemia, and which are sometimes provocative of severe colds or inflammations or the peculiar changes seen in their more severe forms in Raynaud's disease.

On the other hand an equally familiar type is the man who, by reason of renal disease or asthma, or both, develops a hypertrophied, over-active heart, with slow pulse and heaving impulse, as the result of the greatly increased arterial pressure against which the heart is laboring—in other words, develops an arterial tension in which the heart is overwhelmed by resistance or undergoes sudden and fatal or more slow and equally fatal dilatation of its walls.

It is wretched therapeutics to whip up such a handicapped heart by cardiac stimulants; you are simply exhausting the already fagged horse by whipping him up to greater, but temporary, effort.

Again, in the presence of dropsy we are apt to ignore the physical forces concerned in its development and the state of the vascular system, relying almost entirely, aside from efforts for its removal, upon cardiac and renal drugs, and ignoring the leaking vessels which produce the difficulty.

It will be remembered that dropsical exudation takes place from the capillaries, and that the integrity of the walls of the blood-vessels and lymphatics depends upon normal nutrition, or, in other words, upon a proper blood-supply. As a consequence, dropsy may be due to relaxed or poorly nourished vessels as much as to any other cause.

The force exercised upon the column of blood as it is driven out by the heart into the aorta may be considered as the chief support of the capillary circulation, so that if the heart be weak the pressure falls in the arteries, and the rapidity of flow is decreased in the capillaries in consequence, while, on the other hand, an increased cardiac activity hastens the capillary circulation. As the arterial pressure and force depend not only upon the heart force but also upon the tonicity of the arteries which carry the stream, it becomes evident that dilated arteries must lower blood-pressure even if the heart be strong, although practically the heart and vaso-motor system generally fail or increase in tone together. We find, therefore, that either a weak heart or a relaxed artery tends to cause stagnation of the blood in the capillaries, and having found that such stagnation is productive of exudation it is not hard to discover why low arterial pressure is a cause of dropsy.

Having shown this to be true, let us turn to an explanation of the fact that a high pressure in the *veins* is productive of the same changes.

Here the normal pressure is almost nothing, being much less than in the arteries, and considerably less than in the capillaries. The result of this is that in health the blood flows rapidly from the high pressure of the artery to the low pressure of the vein, and passes through the small veins under a gradually decreasing pressure until it reaches the heart. Any obstruction to this venous flow must increase the venous pressure, and, the venous pressure being increased, the rapidity of flow through the capillaries must be decreased. The whole subject may be made more clear by the following example:

Supposing that two iron tubes are connected at one end by several lines of rubber tubes (the capillaries), and that water is flowing into the first tube, or the artery, under a pressure which is represented by the figure 100, while the resistance to the flow in the second tube, the vein, is represented by the figure 0. It at once becomes evident that the rapidity of the flow through the connecting rubber tubes will be very great, whereas if the pressure in the first or arterial tube is decreased to 50 the rapidity is decreased one-half, or if the pressure in the second tube be increased to 50 instead of remaining at 0 the same changes will occur,—in either instance capillary flow is lessened and exudation is caused. This is the pathology of dropsy. Now let us proceed to discover the causes of dropsy in various diseases.

In cardiac disease it is due to a weak heart being unable to supply the arteries with enough blood to maintain the normal pressure, or to a damming-up of blood in the venous system as the result of the imperfect emptying of the cardiac cavities. In the first instance low arterial pressure produces dropsy; in the second, high venous pressure has a similar effect.

In renal troubles the dropsy depends more upon the lack of proper nutritive processes in the capillary-walls and upon changes in the blood-pressure than upon other causes. If the kidney is diseased it may not be able to eliminate the proper quantity of liquids, which accumulate and finally escape into the tissues, while the same failure in renal function causes disease of the blood-paths themselves, and often produces cardiac complications.

Hepatic troubles cause dropsy by producing pressure upon the large blood-vessels going to the liver, and in consequence the exudation is generally confined to the lower limbs and abdomen. If the hepatic trouble be severe, some failure in the nutrition of the

blood-vessels and changes in the quality of the blood may ensue.

Pulmonary disease rarely causes dropsy unless the venous pressure is greatly increased and productive of cardiac dilatation, or, as in phthisis, where the changes in the nutrition of the body involve the blood-vessel walls and the blood.

Having considered the conditions of vaso-motor relaxation and spasm as etiological factors in the development of circulatory changes, we come to the study of what we can do for their relief.

Let us take up the therapeutics of vaso-motor relaxation. Here we find belladonna our standby and mainstay. I am as confident that I have saved life by its use in shock and in the collapse of acute disease as I am satisfied that I am here to-night. One case in particular always stands in my memory as a type of how much good these drugs may do. A child of five years, having passed through the earlier stages of pneumonia, rather uneventfully arrived at the period for crisis. On the day that crisis occurred it sat up in bed for an instant, although the pulse was already weak from the fall in fever, and at once called out, "Light the gas, it's getting dark," and then passed into profound collapse. The case was a desperate one, and, in addition to external heat, I gave hypodermically $\frac{1}{60}$ grain of strychnine and $\frac{1}{100}$ grain of atropine every fifteen minutes, till three doses were used, when the child showed signs of renewed vitality, became flushed from the atropine, and eventually recovered without any further symptoms of note.

The good results following the use of belladonna in such cases have impressed themselves upon me again and again, and the resident physicians in the wards of which I have charge have repeatedly noted the change for the better on the use of the drug. One, at least, has contributed to the THERAPEUTIC GAZETTE a report of the cases treated by this means, with the most happy effect.

There are other facts, in regard to circulatory changes produced by vascular dilatation, which are not to be overlooked. The most important of these is the peculiar capacity for holding and requiring large amounts of blood which the muscles possess. We all know that sudden or prolonged exertion makes us "out of breath" and causes more or less cardiac disturbance. At first this cardiac difficulty evidences itself in labored effort of the heart, because in the early period of muscular contraction the resistance offered to the flow of blood through the muscles is enormously increased. Very soon, however, we develop what has been called the "second wind"—which is not wind, but vaso-motor equilibrium. The muscle, at first anemic from squeezing blood out of itself, soon requires an excess of blood to nourish it under prolonged strain, and its blood-vessels dilate widely and become congested. The opening of these blood-paths relieves the resistance offered to the heart, and this organ therefore pumps blood without difficulty during the remainder of the exercise.

In these facts we have an explanation of sudden deaths occurring in cases of heart disease under exertion. The man with marked cardiac asthenia and dilatation falls dead when the resistance in his vascular system produced by exercise results in paralytic distention of his ventricular walls. Or the man with cardiac hypertrophies associated with aortic regurgitation drops dead on exertion because the pressure makes a greater regurgitation than is compatible with life. Finally we hear of cases where the man has not fallen dead while exercising, but afterwards—that is, when his heart, exhausted by effort, suddenly is called upon to supply widely opening blood-paths after brief effort.

Ludwig has estimated that as much blood flows through the muscles as through the skin and internal organs together, and muscular action is therefore clearly of great effect on the heart. Brunton has well said that by reason of this intimate association between heart action and vascular tension life is maintained, for, "As a rule, whenever the pressure rises in the arterial system, its increase acts as a stimulus to the inhibitory roots of the vagus, and thus slows the pulse. Less blood is thus sent into the aorta, and the tension within it is brought to the normal and kept there. On the other hand, when the arterial pressure falls the ordinary stimulus to the vagus roots is diminished, the heart acts more quickly, and the tension in the aorta is thus again brought up to the normal. Besides this, whenever the tension becomes so great as to inconvenience the heart, the sensory nerves of this organ bring into action reflexly a mechanism for dilating the vessels. In the rabbit these sensory fibres pass upward from the heart as a distinct nerve, the depressor nerve, and when stimulated they cause great dilatation of the vessels in the abdominal viscera, so that the blood-pressure falls at once."

The exact situation of these nerves in man

has not been ascertained, but in all probability a similar mechanism exists. The pulse-rate in health thus depends to a great extent on the pressure within the vessels. In disordered conditions of the nervous system it may vary to a great extent independently of this.

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*THE TREATMENT OF CANCER AND SARCOMA BY FORCED ALIMENTATION AND THE USE OF THE TOXIN OF ERYSIPELAS.**

By B. H. Detwiler, M.D.,
Williamsport, Pa.

Instead of going into details of form and variety, I shall for the present be content to classify cancers as hard and soft, or acute and chronic. These again are subdivided as they meet us in our daily work: some are operable and others inoperable. Cancers are due to local irritation and are composed of incomplete or dwarfed cells, as shown by the small round cells and the spindle-shaped cells. You will recall the fact that all cell-growth is due to cell-division, either directly or indirectly, and by the multiplication and specialization of each cell all the tissues of the body develop under control of the more highly specialized tissues of the nervous system. Thus all tissues are formed and replaced, and the effete matter broken down and eliminated. These incomplete or dwarfed cells multiply as rapidly as normal cells, push themselves through the basement membrane in all directions, and, carried by the circulation, are rapidly disseminated. Carcinomata are distributed by the lymphatics and are more circumscribed; hence at an early stage they are more readily removed.

Inoperable cases are the opprobrium of the profession. Some years ago Dr. Coley, of the Cancer Hospital of New York, noted with others that inoperable cases, especially sarcomata, would recover if the patient was fortunate enough to have an accidental attack of erysipelas. Taking this experience as a cue, he secured serum from a fatal case of erysipelas, and propagated from it a toxin that has produced wonderful results under his skillful care at the New York Cancer Hospital. It is remarkable that other equally skillful men elsewhere have not been so fortunate.

A year ago I saw in New York a number of inoperable cases of cancer, and especially sarcomata, restored to health by the use of these toxins. One case I recall of a young girl who had a sarcoma of the foot, which had been removed by amputation at the ankle in the New York General Hospital. There was a recurrence at the stump and in the popliteal space, and after an attempt at enucleation, as shown by the cicatrix, the case was given to Dr. Coley in preference to amputation of the thigh at the hip. Thirty days' treatment by toxin of erysipelas removed every trace of it. Other cases equally remarkable demonstrated the power of this toxin in his hands.

After careful and conscientious trials in private practice and in the wards of the Williamsport Hospital, it has not proved satisfactory in my hands. I shall detail more fully my experience in several cases that have been under my care, at the close of this paper.

The study of cancer by scientists has as yet produced no positive results, but there is no doubt that in the near future a substance will be produced that will render the system as immune to cancer as antitoxin does to diphtheria. The low-grade cells—or, more properly, the incomplete or dwarfed cells—must be eliminated, and a higher-grade cell substituted. Were this practical, by substituting a cell of higher vitality, there would be no difficulty in curing any form of cancer.

In my efforts to produce this effect, though they were futile, there were some remarkable results that I will relate.

Mrs. K., aged forty-three, mother of three children, had a cancer of the breast removed by Dr. Nutt in the spring of 1893. It had developed after the nursing of her youngest child nine years before. After recovering from this operation, she frequently rode rapidly a hard-stepping horse for hours at a time. This at last was followed by a sharp pain in her back and leg, resembling sciatica. She had suffered long when I was called in consultation; a local lesion of the spine was apparent, which was not rheumatism, but either Pott's disease or cancer, probably the latter. The continued, unremitting pain, with inability to move the body, taxed the combined skill of Dr. Nutt, Dr. Saylor Brown, and myself. In the uncertainty of the diagnosis a plaster-of-paris cast was made under extension, and a leather brace applied, which disappointed us. Extension in bed by weight to the head and feet gave little relief.

Dr. William Pepper was called in, who diagnosed the case properly, although ex-

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*A paper read at a meeting of the Lycoming County (Pennsylvania) Medical Society, Dec. 3, 1895.

amination was difficult because of the pain caused by movement, so that he could not see her spine, but felt the protuberance of the twelfth dorsal vertebra by insinuating his long thin hands under her body. His diagnosis was, cancer of the spine by metastasis from the breast, with a renewal of the disease in the cicatrix of the breast; an early fatal termination was prognosticated.

The suffering continued, being only partially relieved by morphine, and the general condition remained about the same. A more firm extension was made from the head and feet, and hypernutrition instituted in the form of large quantities of concentrated peptonized liquid food, with from one to two pints daily of a very superior old port wine, independent of the usual food. In less than a month her general appearance had improved wonderfully—cheeks were filled out, body and limbs rounded up, and she was the picture of health, without a particle of cachexia; moving her from side to side and rubbing her back caused but little pain; the morphine had been largely reduced in quantity, and the hope was entertained that the diagnosis of Dr. Pepper was an error of judgment, as the cicatrix of the breast did not break down as with a returning cancer. Then the power of assimilating food partially failed her, and for some time she was unable to take the usual amount. Later she regained her appetite, but was unable to continue the course of hypernutrition which had promised so well, but which was unfortunately continued too long.

Weeks and months passed by, then Dr. Donellan was called in consultation. He had a better opportunity of examining the case than Dr. Pepper had had; he considered it Pott's disease, with a possibility of cancer, as it was not probable that Pott's disease would follow from a cancer of the breast; but as there had been no microscopic examination made of the breast tumor, it was barely possible an error of diagnosis had been made, especially as the general health had improved and the large amount of morphine that was necessitated by the disease had been reduced to a fraction of a grain daily.

Arrangements had been made to place her in a plaster-of-paris splint and then on a chair, at the same time keeping up an extension of the head and shoulders by the high-back chair, when a local surgeon, by ways that were peculiar, secured the case, placed a leather brace upon her that he had made from a plaster cast, and directed her to sit up without any support. Immediately there was intense pain, which continued forty-eight hours, and was followed by paralysis of the limbs with total anesthesia. In a month an autopsy was held—at which I was present—disclosing a fracture of the spine and a pressure on the cord that had produced paralysis. There was now no question but that it had been a cancer; and the spinal cord, with a full history of the case, was sent to Dr. Pepper. Her improvement, after so distinguished a physician as Dr. Pepper considered her case limited to thirty days, led Dr. Donellan to believe it a case of Pott's disease in spite of his belief that this disease could not follow from a cancerous breast, and in view of the ability of the patient to have her morphine reduced to a fraction of a grain. We entertained also the expectation that the improvement would continue if she could be relieved of the irritation of extension and be placed safely on a chair braced by a plaster jacket; but the unfortunate change of physicians, followed by the fracture of the spine, confirmed by an autopsy, put an end to any possibility of the kind.

This case demonstrates the value of hypernutrition; not that it will eliminate those low-grade aborted cells that produce centres of irritation and cancer, but it crowds them back for the time being, and when the system can no longer stand the high pressure and in this way resist the encroachment of these aborted cells, it succumbs rapidly.

This is demonstrated in the case of Mrs. B., aged forty-seven, who was a large, fleshy woman, mother of ten children, admitted into the hospital Sept. 25, 1894, for cancer of the uterus. On the 26th she was placed under ether for hysterectomy by Dr. Nutt. We found the broad ligament involved, so merely curetted the cavity of the fundus, as the neck of the uterus broke down under the curette, and freely cauterized it. On Oct. 5 she left the hospital. She was placed under the local action of methylene blue, which produced no favorable results, rather aggravating the disease. The different arsenical pastes were used, without beneficial effect. Finally she was placed under large doses of digestants and old port wine, with local applications of pepsin and salicylic acid. This improved her general health wonderfully, and the local disease improved to such an extent that I reported the case in January, 1895, as an anomaly due to this plan of treatment, and I was confirmed by Dr. Nutt. Subsequently there were improvements and

depressions. She finally died of exhaustion following a rectal abscess involving the gluteal region, due to septic infection more than to encroachment of the disease into the neighboring tissues. From the distress in the epigastrium I felt assured there was a carcinomatous deposit in the stomach, though an autopsy could not be secured. She died Sept. 25, 1895. I had tested hypodermically the erysipelas toxin for some time; it produced the chill and fever, but I never saw any beneficial change.

Mrs. B., of this city, aged forty-seven, had a tumor of the breast that was removed by Drs. Koser and Rich in 1894. It never made a good union, leaving an ulcerated surface with involvement of the other breast. When she was pronounced incurable by Dr. Koser, I gave her the advantage of the treatment of the toxin of erysipelas for two months. It produced its characteristic effects, chill and elevation of temperature, with some improvement — nothing decided; but three months after the toxin had been used I found that the disease had not made any decided encroachment. She has no cachexia, but there is a slight loss of flesh, with the arm action impeded by encroachment of the growth into the axilla.

Mr. H., painter, quite aged, was admitted to the hospital Dec. 28, 1894, with an immense sarcoma of the liver. The case being hopeless, he was given an injection of toxin hypodermically, which produced a slight chill, followed by low temperature. In a week it was tried again, with the same result. He never regained his normal temperature; in fact, the use of the toxin may have expedited his transfer to the beyond.

In May, 1895, Mr. E., a charge from Clearfield County, was placed in the ward, with a rapidly growing sarcoma of the neck. He was operated on by Dr. Youngman. There was so much hemorrhage, with sarcomatous infiltration of the deep arteries and nerves, that the growth was not enucleated. Repair was made in due season. The toxin injections produced no effect on him, and he lived only a month.

These cases, barren of results, show that inoperable malignant growths have not yielded to the erysipelas toxin under my care as did the cases of sarcoma which I saw in the New York Cancer Hospital under the care of Dr. Coley. I was pleased with the marked improvement produced by hypernutrition, and believe that we may expect good results from it, probably only temporary; but for specific treatment we will have to wait till the toxin of cancer is fully demonstrated, which I believe will be in the near future.

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*THE TREATMENT OF TYPHOID FEVER BY COLD APPLIED TO THE ABDOMEN.**

By A. J. Downes, M.D.,
Philadelphia, Pa.

It is a difficult task to make interesting so trite a subject as the treatment of typhoid fever. In general practice, where the bath system is not much used and its striking results not obtained, the mortality rate from this disease is much too high. I have a treatment to present, which can be used anywhere, is easily managed, rational, and so efficient that I feel certain it would give as good results in a large series of cases as does the Brand method.

Referring briefly to pathology, typhoid fever is conceded to be a strictly infectious disease, with distinct local lesions almost invariably found in the lower ileum and the beginning of the colon. The enlarged lymphatic glands found are those in connection with this part of the intestines, and are located behind or near it. The infecting causative process must be most pronounced in this part of the bowel. It would seem, therefore, but logical to act on the disease here at its source, to inhibit if possible the growth of the lesions, the generation of toxin and its absorption—in other words, to attenuate the infecting process.

The treatment I advocate consists in the application of cold to the abdomen by means of ice-bags over the lower coils of the ileum and the beginning of the colon, for the longest periods and with the shortest intermissions consistent with safety; the object being to obtain as low and constant a temperature as possible near the lesions and the infecting process. It might be called the systematic continued intermittent application of cold. The continuous use of the ice-bags causes congestion and in time sloughing of the skin, hence the necessity for regulated intermissions.

In six cases ice-bags were applied fifty-five minutes out of every hour for from seven to ten days. The intermission was too short; discoloration of the skin in all, and necrosis of skin in two, occurred. Periods of forty-

* A paper read at a meeting of the Alumni Chapter of the Jefferson Medical College, Philadelphia.

five minutes, with intermissions of fifteen minutes, were found efficient, but I have come to the conclusion that applications of an hour and a half with half-hour intermissions is the best rule to follow, the time on and off making two hours. Should the temperature rise to or above 103° the ice may be allowed to remain on an hour and three-quarters, the time off being reduced to fifteen minutes. In temperatures above 102°, sponging with ice-water and alcohol during the intermission is an essential part of the system; even in moderate fever two spongings daily should be given.

The effects of this method are four:

First, some inhibition of the lesions,—the arterial supply to the bowel is lessened by the stimulating action of cold on the arterioles.

Second, a similar effect on the efferent lymphatic vessels from the lesions,—their calibre is diminished and less toxin is absorbed.

The third effect is the anti-bacillary or anti-infectious influence. Here we are met by the experiments of Prudden that freezing of media containing the bacilli only partly destroys them. Another experiment of his, however, proves that intermittent freezing and thawing continued but a few times (five) completely destroys them. The effect is more pronounced if at the freezing temperature the liquid state is preserved—moist cold. There is an analogy between the effect of freezing bacilli and then thawing them out, and the effect of the intermittent application of cold, as here advocated, over the intestine containing the typhoid bacilli. True, we cannot lower the temperature of the bowel to the freezing-point, but we can reduce it to or below 60° F., and certainly regular reductions to this point with brief elevations to the blood-heat should materially retard the culture process in the bowel. The typhoid bacillus grows at any temperature between 68° F. and 100° F., but best at the latter point. What effect would result in a freshly inoculated tube of typhoid bacilli, were it subjected to alternations between body-heat and cold? Undoubtedly the process would be inhibited and less toxin (and that weaker) would develop. Does cold over the bowel at the seat of the acute process produce no such effect?

The fourth effect is the physical antithermic influence. It is practically cold in contact with hot coils, for the innumerable vessels of the portal circuit may be so considered. Cool blood passes through the liver, and emerges still cool from the hepatic vein; the inferior vena cava is near enough, especially when the abdomen becomes flat, as it does in a short time, to be influenced; hence the blood enters the right side of the heart and lungs more constantly cool than by any other method. This undoubtedly explains the rapid subsidence of the initial and early bronchial symptoms.

The effect on the temperature is two-fold—antitoxic and antithermic.

By this method, since February, 1895, I have treated eleven cases. Four received no medicine until after the subsidence of fever. Six received no medicine that could possibly have much influenced the course of the disease. Not one dose of an antipyretic was given. A little calomel and small doses of a mineral acid were the drugs used. The eleventh case, in addition to the ice-bag, was given the quinine-chlorine mixture of Yeo.

Certain essential facts were deduced during the conduct of these cases. The cold should be applied not less than three times the length of time it is off. Applications of half an hour, with the same intermissions, are useless, for they practically amount to fifteen minutes of cold with forty-five minutes' intermission, and no effect on either the process or the temperature is possible. At times intermissions of half an hour are too long—in one case a chill often came on near the end of the half-hour, indicating renewal of the process and absorption of toxin.

As the effect desired is the lowest possible temperature, while the ice is on the abdomen the water should be as often removed from the bag as the ice melts; otherwise the resulting fluid becomes a medium between the heat of the body and the ice, with loss of cold. The rapidity of melting and the necessity of renewal of ice varies with the height of the fever. When the temperature is near 102° or less, a bag completely filled may not need refilling for an hour and a half, whereas with the temperature 104° the bag may need filling every half-hour. To lose no time, freshly filled bags should be ready. The number of days ice was applied in the cases was as follows: Case I, twenty-one days, including recrudescence; Case II, six days; Case III, twenty-four days, including recrudescence; Case IV, forty-two hours; Case V, twenty-one days; Case VI, seventeen days; Case VII, nineteen days, including recrudescence; Case VIII, six days; Case IX, nine days; Case X, two days; Case XI, ten days. Ice removed in all cases when temperature of 99° or under was reached.

In all except Case VI, delirium, if present, ceased within twenty-four hours after applying cold. The tongues were moist throughout, early chest symptoms rapidly abated, diarrhea moderated, tympany disappeared, moderate fever was maintained. All but one were seen on or before the day of eruption.

Case VI was a neglected one, seen on the ninth day with a fully developed eruption, profuse diarrhea, profound delirium, immense tympany, nose-bleeding, severe cough with muco-purulent expectoration, temperature 105.6°, pulse 116 and dicrotic, sordes of teeth, dry cracked tongue. The only attention the boy had received was some medicine a druggist had sent without seeing the case—a purge. I am not exaggerating the description of the case, which would have tested any method of treatment. The treatment ordered was: ice over the iliac fossa fifty-five minutes out of every hour, and sponging with ice-water during these short intermissions when the temperature was above 102°. Within a week, while there was still some delirium and slight subsultus, the tongue was moist, the chest clear, cough absent, diarrhea controlled, abdomen flat. The ice was applied seventeen days, and the case convalesced without sequela.

Case X was certainly somewhat unique. J. M., age seventeen, brother of Case VI, had been sick a week. I found him with diarrhea, tympany, tenderness in iliac fossa, nose had been bleeding, some bronchitis, pulse 110, temperature 103°. The eruption came out on the following day. Ice was applied fifty-five minutes out of every hour for two days, when a normal temperature was found and the cold stopped. The temperature continued to descend, the morning range varying from 96° to a fraction above, the afternoon from 96° to 97.4°, for nine days after the removal of cold. It then returned to normal, as did also the pulse-rate, which during this period had been as low as 48. By accurate count the normal temperature was regained on the eighteenth day. During the apyretic period fresh crops of eruptions appeared for some days and the characteristic stools persisted. The temperature in the beginning forbids us calling this case one of typhoid apyretica. Did cold abort the disease and cause the low temperature?

In three cases recrudescence occurred. In one it was intercurrent—the temperature had not yet reached normal. In the other two it occurred after at least two days of normal temperature. In each case there was new eruption. In the first case night intermissions of one hour had been allowed.

During the convalescent stage four cases had thromboses—one in the veins of left leg, two in the right leg, and one in both legs at different times. This last, Case XI, had between these thromboses a severe attack of pneumonia in left lung.

Case XI.—D. D., aged forty-five years, a pale, delicate, overworked clergyman, who had lost thirty pounds before being ordered to bed. Until the appearance of eruption a very moderate fever was present, and no treatment but liquid food had been adopted. Ice was now applied, on the eighth day, with the temperature 101°, and continued ten days, during which time the quinine-chlorine mixture of Yeo was given. A maximum temperature of 102° was reached the second day of the ice. Both ice and chlorine were stopped on the eighteenth day of the disease. On the twenty-first day, thrombosis of veins of left leg, with temperature of 104°, occurred; this was rapidly relieved, and a normal temperature obtained in two days. On the twenty-eighth day pneumonia of a severe type supervened, with temperature for two days of 104°, under ice. Crisis the third day—thirtieth of the disease. On the thirty-ninth day the temperature rose, and for five days it continued above 100° owing to thrombosis of right leg.

I call attention to this case to claim that the early management of the fever by ice and chlorine had so conserved vitality that a very bad attack of pneumonia and thromboses of both legs were safely withstood. On no day but that of maximum temperature during first eighteen days was 101° exceeded. For the first twelve hours of pneumonia, heat was rigidly applied to chest, with little result. Three ice-bags at once were then kept constantly to chest for two days, supplemented part of the time by a fourth on the abdomen. The pneumonia disappeared.

Deaths from typhoid occur most often during the second and third weeks. They are rare during the first or formative week. The chief causes of death are perforation, peritonitis, hemorrhage, hyperpyrexia, and exhaustion. Deaths in the fourth week or after occur in cases which have been severe during the earlier periods. Many cases acutely ill during the early period linger for weeks, suffering from the effects of profound poisoning, and after all die finally from some of the numerous sequelæ. The way to avoid death and the distressing clinical features of typhoid fever

is to attenuate the disease process at its focus as soon as possible. One of the very best means, as I conceive it, to accomplish this is by the application of cold to the abdomen over the bowel, the seat of the infection, supplemented as it may be, or rather should be, by the internal use of a well proved intestinal antiseptic. Of the many, guaiacol and chlorine are the best.

It was my intention in this paper to call attention to the systematic use of an old agent—cold—in the treatment of this fever—not to convey the impression that it is at all unusual to treat successfully so small a number of cases as these eleven, but rather to call attention to the clinical features observed in them. Never under other treatment have I seen cases show such uniformly moderate features during the acute process, and it cannot be questioned that the method of treatment was the cause, since some of them were at the start bad cases.

In conclusion I wish to state that the application of ice to the abdomen is not a new thing. The English have used it for a century. Its use, however, has always been symptomatic. I beg for its adoption as a distinct systematic treatment, and am firmly convinced it will render mild all cases in which treatment is begun before the fifth day of disease, and as much influence and as safely guide later cases as any method of treatment. I decidedly believe that cold to the abdomen will retard all infectious disease processes occurring in the bowel if properly and systematically applied.

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*THE HISTORY OF THE COURSE AND TREATMENT OF FOUR CASES OF TYPHOID FEVER.**

By R. B. Watson, M.D.,
Lock Haven, Pa.

I will briefly present a report of four cases of typhoid fever which have recently been under my care.

The first case was C. B., a colored boy about twenty years of age. He came under my care about the end of the first week of the disease. August 30, I found him up and dressed, with pulse 105, temperature 103°, delirious. I made arrangements to have him removed to the City Hospital, but when we went to his room he had gone out. After a time we succeeded in locating him, and, taking him to the hospital, put him to bed. That night, during the temporary absence of his nurse, in his delirium he jumped out of the second-story window, with nothing on but his shirt. August 31, pulse 120, morning temperature 100.4°, evening 101°. Sept. 1, evening temperature 104°. Sept. 2, morning temperature 104°, evening 105°. About this time he became less delirious, and though inclined to be stupid he was easily aroused and would give intelligent answers to questions. Nothing further of note occurred until the morning of Sept. 5, when a profuse intestinal hemorrhage occurred, with a fall of temperature from 104° to 99°. On the morning of the 6th his temperature had reached 100.6°, but a second hemorrhage was followed by a fall to normal or a little below. Treatment did not seem to have any control over the hemorrhages; he had one to three daily, until he had had nine, when he died.

The treatment in this case was liquid diet, stimulants, cold sponging, and the internal use as well as external application of guaiacol. For the intestinal hemorrhages I used nitrate of silver, with no effect whatever. In fact, all the remedies used seemed to be useless, having no perceptible effect, not even the external application of guaiacol, which did not affect the temperature one-fifth of a degree. This fact I consider remarkable, as from the testimony we have of the effect of guaiacol applied externally in reducing temperature we cannot question its power to do so.

The second case was R. G., aged thirty-four. On October 9 I found him with pain in limbs and back, headache, pulse 86, temperature 100°. As there was a case of typhoid in the same house, I concluded this was commencing typhoid. I ordered him to bed, put him on liquid diet, and gave him a pill consisting of podophyllum $\frac{1}{960}$ grain, calomel, guaiacol carbonate, and menthol, each $\frac{1}{16}$ grain, every half-hour, until his bowels were moved five or six times in twenty-four hours; then changed to a pill in which the guaiacol carbonate was increased to $\frac{1}{8}$ grain, and adding $\frac{1}{16}$ grain of thymol, every two hours. Did not see him again until the 11th; his pulse was then 86, temperature 101°, bowels had been moved six or seven times, stools characteristic of the disease, no tympanites,—expressed himself as feeling well. Saw him again on the 13th; no change in symptoms. In addition to his pill, I then gave a capsule containing guaiacol carbonate 3 grains, thymol 1 grain, menthol ½ grain, and eucalyp-

*Read before the Clinton County (Pennsylvania) Medical Society, Nov. 20, 1895.

tol 5 minims, every three hours, and continued his pills, alternating with the capsules. As he was nearly ten miles from town and seemed to be doing as well as we could expect, I did not intend to see him again until the 15th, but was sent for on the 14th. Found him somewhat tympanitic and suffering very severe pain in the abdomen, but he even then expressed himself as feeling all right except for the pain; his pulse, however, was small and quick. For the pain I gave him small doses of morphine, which relieved him until the afternoon of the 15th, when the pain recurred with increased severity, abdomen became very tympanitic, pulse 130, cold perspiration, hands and feet cold, hiccough, and almost constant regurgitation of a greenish-black fluid. I did not expect him to last through the night, but he lived until the morning of the 17th, when he died with all the symptoms of perforation.

What is interesting in this case is the early stage when perforation occurred. Patient was under antiseptic treatment, such as is recommended by Woodbridge, of Youngstown, Ohio, and claimed by him to abort any and every case of typhoid, especially when commenced in its earliest stage; liquid diet was given, and, before perforation occurred, there was no symptom of severity—movement of bowels was less frequent, pulse less accelerated, and temperature much lower, than in the majority of cases. He had not been sick more than a day or two before the antiseptic treatment was commenced, still it did not prevent perforation, which was the direct cause of death.

CASE III.—Was called to see O. M., aged thirty-two, October 7, 1895. Found him in bed, with red, dry tongue; pulse 100, temperature 102°; some little pain in abdomen, with general feeling of prostration, and loose bowels. He had not been well for about a week or ten days, but had continued at work until Saturday, October 5, and as he was not improving any, but rather growing worse, he sent for me on the 7th. I diagnosed the case to be one of typhoid fever, and ordered Woodbridge's tablets No. 1, containing podophyllum $\frac{1}{100}$ grain, calomel, guaiacol carb., and menthol, each $\frac{1}{10}$ grain, and eucalyptol—one of these tablets every fifteen minutes until five or six evacuations of the bowels were produced in the first and second twenty-four hours. As the patient was ten miles out of town and not very accessible, I did not see him again until the 9th; then he was pretty much in the same condition as when I last saw him; the tablets had produced five or six evacuations. I then, as recommended by Woodbridge, gave him in addition to tablets No. 1, tablets No. 2, which differed from No. 1 only in the quantity of guaiacol carb.—¼ grain instead of $\frac{1}{10}$—and also containing $\frac{1}{10}$ grain of thymol. These tablets were given every two hours, and, as his bowels had not been moved too freely, I continued No. 1 also. I saw him again on the 11th, when his condition was indeed alarming. Through some misunderstanding, after his bowels commenced to move freely the nurse did not stop the tablets No. 1, but continued them with No. 2. His bowels had been and were moving about twenty to twenty-five times per day on the 10th. When I saw him on the 11th, his bowels were moving involuntarily, tongue dry and covered with sordes—not able to protrude it,—pulse 130, and temperature 103°; no tympanites. I stopped both tablets, and ordered the capsules (containing guaiacol carb. 3 grains, thymol 1 grain, menthol ½ grain, and eucalyptol 5 minims) every three hours. In connection with the above, he got milk punch every two hours, milk, and mutton broth, with a sponge bath whenever the temperature reached 102°. On the 13th his condition was about the same, only the bowels were not moved so frequently. On the 14th, pulse being 120 and temperature 101.4°, the capsules were continued, and, as his bowels had only moved twice, tablets No. 1 were ordered to be taken every hour until bowels moved four or five times in twenty-four hours, when No. 2 was to be resumed, alternating with the capsules. His condition improved, and on the 20th the morning temperature was normal, delirium all gone, bowels moved three or four times per day, evening temperature 100.6°. He continued to improve, evening temperature each day becoming lower, morning temperature normal, until the 28th, when he complained of a great deal of pain in his right hip and thigh. From the character of the pain I supposed he was developing phlebitis, and this supposition was confirmed on my next visit, as I then found him suffering intense pain in right leg, which he was unable to move, and which was swollen to the foot; he subsequently went through an attack of phlebitis, with all the typhoid symptoms gone. He had some little elevation of temperature and acceleration of pulse, but the former I attributed to his phlebitis, and the quick pulse to the same cause and to the prostration naturally following the typhoid.

An interesting feature in this case, and one which may have had some bad effect, although I cannot attribute any to it, was that he was covered with a syphilitic eruption and had been for two or three years previously. The eruption improved under the application of mercurial ointment to his leg for the phlebitis, which he insisted was the only thing that relieved the pain.

In this case, was the duration of sickness, not counting the phlebitis, less than that of most typhoid cases? Morning temperature was normal in two weeks from the time I first saw him, but we could not call him convalescent until the evening temperature became normal, which was about the twenty-first day after I was called to the case, but he was ill for a week or ten days before I did see him, so in my mind it is a question if the duration of the disease was shortened by the treatment. The prostration, occurring so early in this case, I believe to have been caused by the excessive action of the tablets; his rapid improvement after the action of the bowels was checked goes to show this, and that they were checked merely by the withdrawal of the medicine, without any opiate or astringent, also shows it.

CASE IV.—Mrs. W., aged sixty. This woman was nurse at the hospital, and took care of Case No. I, and I believe she contracted the disease by eating the mutton broth and other food that the boy left. I was called to see her on October 25, at which time she had been confined to bed three or four days; she said she had not been well for the past two weeks. I found her with pulse 86, temperature 102°, some diarrhea—liquid, ochre-colored stools. I put her on tablets No. 1, as recommended by Woodbridge, for twenty-four hours, and then gave her the No. 2 tablets, and on the 28th an emulsion containing 3 grains guaiacol carbonate, 1 grain thymol, ½ grain menthol, and 5 minims eucalyptol, to the drachm, and gave her a drachm every three hours, alternating with tablets No. 2. The case progressed favorably until Nov. 8, when her temperature was normal and pulse but 86. On the morning of Nov. 9 she was about the same, and I thought she was convalescent, but on the evening of that day she had a profuse intestinal hemorrhage, which resulted in death on the evening of the 10th. The wonder is that this case progressed so favorably up to the 8th of November, as she had practically no nursing.

One fact was apparent in each of the three cases, and that was the absence of tympanites. In Case No. II there was none until after the perforation occurred. Dr. Woodbridge claims there need be no fatal cases of typhoid fever, and says he has had nineteen years' experience in treating the disease and has had no deaths in thirteen years, making use of the treatment that I have tried in three of the cases cited. I believe from the results in these three cases we are justified in concluding that Woodbridge's treatment does not cut the disease short—or, rather, does not abort it—and that it does not prevent hemorrhage nor perforation, nor does it always insure recovery in every case, as he claims. We all have, at different times and with different forms of treatment, treated a number of typhoid cases without a death, and then have lost a number of patients when following precisely the same treatment. From the discussions published lately in various medical journals, and from my own experience, I have arrived at the conclusion that in the beginning of the fever we ought to keep the bowels well opened and thus as far as possible eliminate the poison of the disease; then give some remedy to affect the intestinal walls (almost any of the well known antiseptics); then follow that up with the cold bath, or at least the sponge bath, and repeat as often as necessary to lower temperature. After the second week I do not believe any antiseptic will relieve the intestinal lesion. Professor Osler, in his work on Practice, makes this statement: "The profession was long in learning that typhoid fever is not a disease to be treated by medicine." I would close by saying that there are a great many in the profession to-day who have never learned this fact, and it will take some time and a good many deaths from the disease before they realize the truth of Dr. Osler's statement.

THE SO-CALLED INTESTINAL INDIGESTION.

BY W. S. CHRISTOPHER, M.D.,
Professor of Diseases of Children, Chicago Policlinic; Professor of Pediatrics, College of Physicians and Surgeons, Chicago.

The occurrence of flatulence, accompanied by acids, is a clinical phenomenon frequently met. It is customary to speak of this condition as intestinal indigestion of starches. It is proposed to show here that this process is not one of indigestion at all, and that the term "indigestion" is absolutely wrong and extremely misleading. The use of this term

"indigestion" has led to some methods of management of such disorders which are not free from objection. It is well recognized that the condition is dependent upon the starchy and saccharine foods for its maintenance, but it is important to determine its exact relation to these foods.

In the first place, normal digestion of all starches under the action of the normal amylolytic ferments consists in the conversion of the starch into sugar, and for our present purpose it is immaterial to discuss the point whether this resulting sugar is maltose or dextrose, or whether maltose be first formed and dextrose subsequently. In the case of saccharose, cane-sugar, the digestion is accomplished by transforming the cane-sugar into a mixture of dextrose and levulose, commonly called invert sugar. Whatever carbohydrate be ingested, the ultimate end of its digestion is a reducing sugar. In this condition of sugar it is absorbed from the small intestine, because the bulk of the digestion of the starch occurs in the duodenum or small intestine under the influence of the amylolytic ferment of the pancreas.

As a matter of fact, all the sugar so formed in the small intestine is not absorbed. Some of it invariably undergoes further fermentation under the influence of bacteria present, with a resulting formation of various acids and gases, so that there is always present in the small intestine some gas which has originated from the carbohydrate food ingested, and enough acid to maintain in the small intestine an acid reaction, in spite of the sodium carbonate which exists in the pancreatic juice. When the fermentation of gases and acids by the bacteria becomes excessive, the condition is usually spoken of as amylaceous dyspepsia, or intestinal indigestion. None of the micro-organisms, so far as known, which are capable of producing these gases and acids, produce them directly from the starches, but only from the sugars; that is to say, before the abnormal products may be formed, there must first occur a normal digestion of the starches, and the abnormal products are formed from the products of the normal digestion. It is thus clear that the term "indigestion" is eminently improper in this connection. I have elsewhere* called attention to this condition, under the title "Superdigestion," which was used for the purpose of indicating that the process was not indigestion, but rather a further splitting up than occurs even in normal digestion.

Macfadyen, Nencki and Sieber* have succeeded in identifying seven micro-organisms which give rise to fermentation in the small intestine.

The following table, adapted from Gamgee's Physiological Chemistry of the Animal Body, vol. ii, shows the list of these organisms, with their actions upon sugar:

Designation.	Products of Fermentation.
1. Bacterium Bischleri.	Alcohol, Acetic acid, Lactic acid (inactive).
2. Streptococcus liquefaciens ilei vel acidi lactici.	Lactic acid, Traces of alcohol.
3. Bacterium ilei (Frey).	Succinic acid, Lactic acid (active), Alcohol, CO_2 and H.
4. Bacillus liquefaciens ilei.	Traces of alcohol, Traces of volatile acids, NH_3, etc.
5. Bacterium ovale ilei.	Alcohol, Sarcolactic acid, Traces of acetic acid?
6. Bacillus gracilis ilei.	Alcohol, Sarcolactic acid.
7. Bacterium lactis aërogenes (Escherich)?	Alcohol, Succinic acid, Sarcolactic acid, Traces of acetic acid.

Besides these actions, there is reason to believe that the lactic acid may be split up still further under the influence of a butyric ferment into butyric acid, carbonic acid gas, and water. Such alcohol as is formed may also undergo the acetous fermentation, and the resulting acetic acid be subsequently broken up, giving rise to carbonic acid gas and marsh gas. In certain of these bacterial fermentations, hydrogen is also evolved. It may be conceded, therefore, that sufficient knowledge exists to assert: *First*, that the normal digestion of the starches, occurring under the influence of the physiological amylolytic ferments, leads to the formation of fermentable sugars. *Second*, that some of these sugars are usually transformed in the small intestine, under the influence of various micro-organisms, into various acids and gases. *Third*, that at times this secondary bacterial fermentation occurs in excess, and constitutes the

* *New York Medical Journal*, Nov. 9, 1889.

* "Untersuchungen über die Chemischen Vorgänge im Menschlichen Dünndarm." *Arch. für Exp. Path. und Pharm.*, vol. 28 (1891), p. 311.

condition known as "intestinal indigestion." *Fourth*, that the term "indigestion" is here improper, and instead the term "super-digestion" should be employed.

This pathology is the same to which I called attention six years ago in the article previously referred to, and the method of treatment based upon this conception of the pathology I have continued to employ during this whole period with the most satisfactory results. In the management of such cases the first step is to withhold from the food of the patient all carbohydrate material, for the purpose of keeping from the offending micro-organisms the material upon which they live. If this process of starving out the micro-organisms be carried out long enough, they must certainly die. After a period of two to four days, carbohydrates may again be allowed, commencing with small quantities, for the purpose of determining whether the small intestine is ready to receive them. If it is not ready, a renewal of the symptoms will immediately occur. It is, however, difficult for patients to refrain entirely from the use of carbohydrate food during long periods, and it is therefore desirable to have some means by which the starchy foods may be administered, and the damage resulting from them diminished or controlled.

I have found a very effective means, indeed, when the abnormal fermentations are limited to the small intestine, in digesting the starch in the stomach, from which organ the resulting sugar is directly absorbed and does not, therefore, reach the seat of the trouble in the small intestine to maintain the unpleasant symptoms. At times very considerable quantities of starches can be thus digested in the stomach. At other times the process is not very successful, but in general a sufficient quantity of carbohydrate can be thus digested in the stomach and prevented from ever reaching the small intestine, to meet all the needs of the patient, while starving the micro-organisms in the small intestine. For the purpose of thus digesting starches in the stomach, it is my custom to administer an active diastatic ferment immediately after meals and before the secretion of hydrochloric acid has reached such a degree as to interfere with the diastatic action. According to Chittenden and Griswold, the presence of 0.005 per cent. of hydrochloric acid increases the diastatic action of saliva, while a stronger acid diminishes it, 0.1 to 0.4 per cent. being sufficient to completely stop the action of the saliva.

Lately the diastase which I have employed for this purpose is Taka-Diastase, in doses of three to five grains of the powder, which has proven more satisfactory in my hands than any other amylolytic ferment which I have ever employed. It has long been known that a diastatic ferment administered in cases of this kind was followed by good results, and this fact has probably still further assisted in maintaining the erroneous opinion that the essential feature of the pathology of these cases was indigestion. It would seem clear, however, that the use of the diastase is not to assist the normal digestion at all, but instead to digest the starches in an unusual place; to short-circuit the carbohydrate, as it were, and to keep sugar from the small intestine without depriving the patient of all carbohydrate food. When abnormal fermentations of sugars occur in the stomach, as they occasionally do, a diastase is absolutely valueless in the management of such super-digestion. Indeed, if it can have any effect at all, its effect will be bad rather than good under such circumstances. It is clear, also, that diastase in some cases may not alone be sufficient to entirely control the situation; it may become necessary to cut down the amount of carbohydrate food allowed.

Furthermore, it is not yet clear under what conditions this fermentation becomes excessive, and, therefore, in some cases, additional factors must be taken into consideration. I have frequently found that abnormal carbohydrate fermentations occur particularly in infants who are subjects of the uric acid diathesis, and I am of the opinion that this diathetic condition plays an important rôle in the prolongation of such cases.

ALUMNOL IN GONORRHEA.

CHOTZEN (*Journ. de Médecine de Paris*, Jan. 12, 1896) holds that alumnol, one per cent., destroys gonococci without increasing inflammation. Bacteriological examination of the discharge shows beyond cavil the inhibiting action of the alumnol upon the gonococci. For anterior urethritis a one- or two-per-cent. solution (℥ iss) is employed at first six times a day, later three times a day. When the gonococci disappear, the solution is reduced to ¼–½ per cent. In posterior urethritis a solution of from one to five per cent. is instilled, or alumnol ichthyolate is employed in two to ten per cent. In case of urethral or cervical gonorrhea in women, injection of alumnol ichthyolate is employed, also alumnol bougies.

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Leading Articles.

VERATRUM VIRIDE IN PUERPERAL ECLAMPSIA.

Ever since the publication in 1871 of the noteworthy paper of Fearn, in which he highly praised the administration of what we then considered heroic doses of veratrum viride in the treatment of puerperal eclampsia, the profession has been giving this method a larger trial each year, and the results of this increasing experience seem to endorse even the enthusiastic views of the originator of this method. As long as eight years ago the THERAPEUTIC GAZETTE published in its editorial columns an article calling attention to the paper of Dr. Oatman, recommending doses equally large or larger than those of Dr. Fearn; and more recently there has come to our hand, in the shape of a clinical contribution from the pen of Dr. Reamy, of Cincinnati, additional evidence of the good results obtained by this treatment. Further than this, we believe that many of the great obstetric teachers of the day recommend this method to their classes, while they equally strongly condemn the employment of pilocarpine for the production of a sweat. Thus, Hirst directs that veratrum viride should be given in the dose of fifteen drops of the fluid extract hypodermically for the purpose of reducing the pulse-rate to 60, and if this dose fails to do good, he advises that additional doses of five drops each shall be administered with sufficient frequency to obtain this circulatory result. Dr. Lusk and Dr. Parvin mention the treatment and state the advantages which are claimed for it, but the former expresses a dread of its depressing effects, while the latter, quoting the authorities who recommend it, fails to state his own personal opinion.

Among persons who are accustomed to obtain by five- or ten-drop doses of the tincture of veratrum viride marked circulatory sedation in the early stages of acute inflammatory processes the massive doses which are recommended by obstetricians will seem unsafe, but a careful examination of the subject seems to prove that in reality the boundary line of danger is not passed when these doses are given. In the first place, there are a large number of cases on record in which poisoning has been produced by very much larger doses than any employed in obstetrics, with recovery as a result, and we all know that the number of casualties from the ingestion of this drug in any dose is very small.

The method by which veratrum viride is supposed to do good in cases of puerperal eclampsia is a double one. Chiefly from the action of its alkaloid, jervine, it powerfully depresses the circulation, and so bleeds the woman into her own vessels, relieving by this means congestion of the cerebral and spinal vessels and reducing in all probability any spasm of the renal blood-vessels which may be present, thereby causing marked increase in the flow of urine. In addition to this action, jervine also acts as a powerful sedative to the motor tracts of the spinal cord, and so directly quiets nervous excitation, while the copious sweating which often follows its administration aids in relieving the blood of impurities, the kidneys of congestion, and relaxes the peripheral blood-vessels. In the experience of Dr. Reamy, the doses which were given with successful results by means of the hypodermic needle consisted of twenty drops of Norwood's tincture of veratrum viride, a preparation which, it is to be remembered, is a saturated tincture many times stronger than that which is official in the United States Pharmacopœia. Personally, we believe that Norwood's tincture ought never to be called for, as its sale in the drug store is apt to cause confusion with the of-

ficial tincture, and because it is not of a definite strength. We believe that the official fluid extract, or normal liquid, of veratrum viride should always be chosen in the treatment of this condition. We trust that those of our readers who have had a large experience in this method of treatment will write to the GAZETTE, giving their fellow-subscribers the benefit thereof.

THE TREATMENT OF TYPHOID FEVER.

At a recent meeting of the Philadelphia Alumni Chapter of the Jefferson Medical College that body was addressed by Dr. H. G. McCormick, of Williamsport, the President of the State Board of Medical Examiners, and in his address he dealt with the subject which appears as the title of this editorial. After dwelling thoroughly upon the point that the infection of typhoid fever finds its way into the body through the alimentary canal and manifests itself chiefly by organic lesions in Peyer's patches, he emphasized the necessity, in his opinion, of keeping the surface of these ulcerated glands as clean as possible, treating the ulcers in the bowel very much as we would treat ulcers on the external surface of the body, with the object of preventing septic absorption through the ulcerated surfaces, aiding in the healing of the ulcers and in the prevention of intestinal hemorrhage. He pointed out, too, the fact that in many cases of typhoid fever not only the glands of the small but also those of the large intestine were markedly affected, and therefore that it was possible, and it was his custom, to invariably use high injections of pure water or normal saline solution, for the purpose of rendering the large bowel as clean as possible. With the object of maintaining intestinal antisepsis, he has been in the habit of administering small but frequently repeated doses of calomel, and, if necessary in order to keep the bowels actively moving, has also administered saline cathartics, believing that moderate diarrhea in the majority of instances is rather for the good of the patient than for his injury, since it prevents the locking up in the intestine of toxic material, and is rarely, if ever, in his opinion, so pressing a symptom as to require control. He believes that the calomel or its changed forms in the bowel prevent intestinal putrefaction, and that the copious flow of bile which it produces aids very materially in preventing fermentation, and so inhibits the formation of gas with all the distressing symptoms following excessive tympanites. In order to reduce the temperature of the patient, as well as to remove morbid materials from the large bowel, the water which he injects is, to use his own words, "as cold as ice can make it," and of course such a fluid, injected high up into the bowel into the very centres of the fever, reduces the temperature very effectually. While regarding with pleasure the good results which have been obtained in the hospital treatment of typhoid by the use of Brand's method of bathing, Dr. McCormick has found this method practically impossible in private practice; but, on the other hand, he thinks that the high injections of cold water which he recommends can be employed even by the untrained nurse. In addition to these facts in regard to the treatment of enteric fever, he urged upon his audience the distinct inadvisability of administering opium or acetate of lead in the event of intestinal hemorrhage arising as a complication, as he is firmly convinced that the continued free movement of the bowels during hemorrhage is capable of no harm, while the locking up of the bowel, on the other hand, simply tends to produce distention from gases, straining of the ulcerated surfaces, and interference with the circulation, which is already sufficiently impaired. He is also in the habit, for the purpose of producing intestinal antisepsis, of administering guaiacol in small doses several times daily, since, at the same time that the fever is relieved by this drug, he believes that it acts as an efficient intestinal antiseptic. In the majority of instances guaiacol itself is given, but should this drug disorder the stomach he employs the carbonate of guaiacol, and has yet to meet with instances in which the latter drug interferes with normal gastric action.

Another paper read at this meeting was that of Dr. Downes, published in this issue of the GAZETTE. The method of applying ice-bags to the abdomen in treating cases of typhoid fever is of course not new, and we should be afraid to employ the prolonged applications recommended by Dr. Downes, but "the proof of the pudding is in the eating," and if good results are obtained by this method there is no reason for not employing it.

CALCULOUS ANURIA.

Given a case of complete suppression of urine due to a kidney calculus obstructing the ureter, the necessity for surgical intervention is to-day universally conceded. Though on this one point there is a practical una-

nimity of opinion, widely divergent views are still held regarding the cause of suppression, the symptoms and signs denoting that calculus is a cause of such suppression, the method of determining the kidney affected, the time for intervention, and finally the particular form which intervention shall take.

Seguen (*Annales des Mal. des Org. Genito-Urin.*, 13 An., No. 10), in reporting four cases of calculous anuria treated by operation, with successful issue twice, regrets that failure on the part of surgeons to publish their fatal cases deprives the student of an opportunity of definitely settling many of the disputed points. He classifies anuria as reflex, toxic, and mechanical.

Reflex anuria is that observed when a healthy kidney fails to secrete as a result of nervous influence, as for instance the suppression following a severe abdominal operation, or the almost complete suppression commonly observed in renal colic. As a result of closer clinical study, the number of cases of reflex anuria is daily diminishing—and it is worthy of note that nearly every case of complete suppression, even though there exist an apparently sufficient reflex cause, will show more or less disorganized kidneys.

Toxic anuria is that of nephritis; whatever be the cause, the ultimate result is destruction of the secreting substance, hence the anuria.

Mechanical anuria is that due to obstruction of the ureters, whether it be from pressure of tumors from without, from twisting, kinking, or stricture, or from lodgment of a calculus. Seguen holds that calculous anuria is absolutely mechanical, and is observed only in those who have but one functional kidney. This is shown by the results of autopsies and by clinical experience. The suppression of function on the part of the other kidney is not a reflex resulting from calculous obstruction of the involved ureter, but is a long-standing pre-existing condition, hence the hopelessness of waiting for this imagined reflex to cease from being operative. The anuria will continue as long as the channel from the remaining healthy kidney is completely obstructed. As a result of sudden increase of pressure in the pelvis of the kidney, this organ ceases to secrete. This failure to secrete is not due to a ureteral reflex, but is solely due to tension.

It is true that when the kidney has become much disorganized, as in long-standing lithemia, there may be anuria associated with calculi which have not been obstructive. Such cases are classed as toxic rather than calculous, and are not benefited by operation. One such case resulting fatally is reported. The diagnosis may be impossible, but since these cases are much rarer than calculous anuria, when there is good reason to suspect the latter an operation should be performed.

Reflex anuria associated with blood in the bladder may also be impossible to distinguish from calculous anuria.

The anuria of surgical nephritis is preceded by a long-standing polyuria, gives rise to no renal pain, and causes rapid development of uremia. Locally there is neither hematuria nor contracture of the abdominal muscles.

The kidney in calculous anuria is congested but not materially enlarged, hence can be felt with difficulty if at all; the diagnosis is founded on sudden suppression of urine, either with pain or without, and the drawing of blood from the bladder by catheter, or the passing of it spontaneously. The determination of the side affected may be extremely difficult in the absence of distinct kidney enlargement and a clear history as to pain; this is decided by local tenderness in the kidney region, by resistance of the abdominal muscles of the affected side to deep pressure, or by ureteral tenderness elicited by rectal examination. The seat of obstruction is still more difficult to determine; a study of cases shows, however, that in two-thirds of all cases the calculus is arrested at the kidney orifice of the ureter or within a short distance of this. It is possible that severe persistent pain, of long standing, would point to partial descent of the stone, since pain practically ceases when the latter is arrested.

As to the time for operation, this should be performed immediately when a diagnosis has been established with reasonable certainty, because the condition present not only threatens life directly and immediately, but progressively brings about disorganizing changes in the kidney which when well advanced cannot be repaired even though the kidney obstruction be removed. Indeed, the operative successes have been proportionate to the promptness with which nephrotomy was performed. Seguen has collected twenty-five cases of calculous anuria in which operation was performed; ten died. Taking only the cases operated on in the first five days of suppression, the mortality was reduced about one-half.

As to the choice of operation, nephrotomy is greatly superior to pyelotomy or ureter-

otomy (the position of the stone not having been definitely determined), because it lessens the kidney congestion by bleeding, allows of thorough exploration and clearing-out of the pelvis, and facilitates retrograde catheterism of the ureter; this should always be done after removal of the most obvious obstruction, a stone in the ureter being either pushed up or cut upon and removed, with subsequent ureteral suture.

In opening the kidney in these cases it should first be thoroughly freed and delivered into the wound, so that its vessels can be seized between the thumb and finger; an incision is then made into the convex border, going through the kidney substance and freely opening the pelvis. Calculi — and there are usually many—are removed with the finger, scoop, and fountain syringe. If the ureter is permeable as far as the bladder, the kidney wound is sutured with fine catgut, the organ is sewed in place as in the case of floating kidney, and the parietal wound drained and closed. If the ureter is not surely patulous, a drainage-tube is passed into the kidney pelvis and thus a lumbar fistula is formed.

Reports on Therapeutic Progress

ON THE THERAPEUTIC EMPLOYMENT OF THE SUPRA-RENAL GLANDS.

The encouraging results obtained by the use of various glands, notably the thyroid, in therapeutics, render the recent studies of Oliver in the *British Medical Journal* of September 14, 1895, particularly interesting. He states that during the winter of 1893–4, while prosecuting an inquiry as to the agents that vary the calibre of the arteries as determined by an instrument (the arteriometer) which the author has described elsewhere, he found that the administration, by the mouth, of a glycerin extract of the adrenals of the sheep and calf produced a marked constrictive action on the arteries, and from these observations he concluded that in all probability at least one office of the adrenals was to provide some material to the blood which contributed to the maintenance of tone in the arterial wall.

This position has since been confirmed by a research undertaken by Professor Schafer and the writer in the Physiological Laboratory of University College, London. They have found that the adrenals of man and of animals—for example, the sheep, calf, dog, guinea-pig — produce precisely the same physiological effects, and provide a material which, when injected in even very minute quantity into a vein—for example, of the rabbit, cat, dog, monkey,—induces a most energetic contraction of the arterial wall, especially of the terminal arteries, and of the heart—a contraction which raises in a very striking manner the blood-pressure in the medium and more central arteries. They have, moreover, proved that this contraction of the muscular tissue of the circulatory apparatus takes place quite independently of the nervous system, and is very much more pronounced than that which they succeeded in obtaining from drugs, such as digitalis and ergot. The contraction which invariably follows the injection in from twenty to twenty-five seconds is shown by a very decisive fall of the lever which records on the kymograph the size of an organ enclosed in a plethysmograph or oncometer, such as a limb, the spleen, or the kidney; that of the spleen, with its rich endowment of muscular tissue, being the most pronounced of all.

Inhibition of the heart, the result of stimulation of the cardiac inhibitory centre in the medulla oblongata, is a marked feature in the physiological effects; the frequency of the ventricular contractions is in consequence very markedly reduced, even to one-fourth or one-fifth, and during the acme of the supra-renal effect the auricle is for a time almost or even completely inhibited. Notwithstanding this remarkable slowing of the ventricle, the blood-pressure within the arteries is raised, and may become even more than doubled; when the vagus action is eliminated (as by section of the vagi or by subcutaneous injection of atropine), it may even be quadrupled, and then the heart's action becomes also exceedingly rapid and energetic.

This research has shown that the adrenals are undoubtedly secretory glands, and that the area in which the powerful active principle is formed is confined to the medullary portion, and consequently when this part of the gland is destroyed by disease (as in Addison's disease) the adrenals provide an extract which is totally devoid of physiological properties. It has, moreover, demonstrated that the product which the medulla furnishes to the blood has a special affinity to the muscular tissue, whether striped or plain, and is in all probability intimately associated with the production of muscular tonicity. In Addison's disease we know how much the tone of muscular fibre, whether in the heart, the

blood-vessels, or the voluntary muscles, fails; and undoubtedly an explanation of this remarkable lack of tone is afforded by the physiological observations which Professor Schafer and the author have recently made.

The experiments in the laboratory have afforded useful information in four directions bearing on the clinical side of this inquiry: *First*, they have clearly and decisively shown in what way the product which the blood derives from the adrenals affects the organism, thus illustrating the function of the gland, and suggesting the lines on which it may be rendered useful as a therapeutic agent. *Secondly*, they have demonstrated that very large doses may be administered to the dog, cat, etc., without apparent injury or loss of life; and it may be inferred from this fact that comparatively large doses may be taken by man without risk of harmful result. *Thirdly*, they indicate that the stomach may be chosen as the best avenue for administration; for the research disclosed the fact that predigestion by pepsin and hydrochloric acid does not impair in the slightest degree the activity of the extract. This fact in regard to the supra-renal glands agrees, therefore, with the general experience of the effective ingestion of the thyroid gland. And *fourthly*, the experiments show that the powdered gland dried *in vacuo* is the best preparation; for the results were equally decisive whether produced by an extract of the fresh gland or by one derived from the powder of the dried gland, even though the latter had been kept for many weeks.

In the earlier part of this inquiry the author employed a tincture and a dried aqueous extract; but he now prefers tablets of the dried gland (three to five grains), which are equal to about five times their weight of the fresh gland. He has always found it best to maintain the effect by administering a tablet at regular intervals—for example, twice or three times a day and within an hour after meals. He has given the adrenal preparation for lengthened periods without observing any injurious effect: for instance, a patient has taken the tincture (15 minims, = 15 grains of the fresh gland) three times a day for just twelve months. Moreover, in one case of diabetes he did not observe any distressing effect from eight five-grain tablets (each equivalent to twenty-five grains of the fresh gland) taken three times a day for a week. But this is the only case in which he has given comparatively large doses. He has always preferred to feel his way, guided mainly by a sense of well-being in the patient, and the readings of the arteriometer; and whenever he has observed signs of undue arterial tension and of oppression, or a marked degree of infrequency of the pulse (as in one case a reduction to 54), he has either diminished the dose or given it less frequently. In the majority of cases a three-grain tablet three times, or after a time twice a day, or a five-grain tablet twice a day, has sufficed to maintain a favorable effect.

The author's opportunities for observation in Addison's disease have been limited to two cases. In one the symptoms were not very definite, but in the other they were pronounced 'and the diagnosis had previously been made by Dr. Pye-Smith. In this case anemia, asthenia of the heart and of the muscular system, anorexia and the characteristic pigmentation were present in a marked degree. The bronzing was observed on the temples, sides of neck, ears, chest, abdomen, and axilla; there were no pigmentary patches, however, within the mouth. The supra-renal treatment was commenced on July 21, 1894, and in December the bronzing was found very much reduced and the patient in every respect much improved—appetite and digestion good, nausea but rarely felt, and there was nothing to prevent the taking of customary exercise. A recent report from her medical attendant, Dr. Mackern of Blackheath, shows that the improvement continues so long as the supra-renal preparation is regularly taken. Occasionally it has been omitted for a week, when the patient is certain that pigmentation on the forehead becomes more decided.

It must not, however, be supposed that every case—or indeed the majority of cases—of Addison's disease will respond to supra-renal treatment in so striking a manner as in this instance; for it will be remembered that a very large number of the cases depend on tuberculization. It is, however, not improbable that now and then cases may be met with in which the function of the adrenal glands has become lowered by some temporary cause, or impaired or crippled by a pathological state which has ceased to advance, or which is advancing but slowly, and the influence of which only becomes more particularly apparent when the general health fails, from whatever cause. Then it may be that the supra-renal material introduced by stomachal ingestion will provide physiological aid of prime importance by merely supplementing the diminished autogenic supply. We have yet to learn whether supra-renal

feeding will enable life to be maintained when the secretory function of the adrenals is abolished by disease.

Inasmuch as the distinctive cardio-vascular effect which invariably follows the injection of even very minute doses of supra renal extract is undoubtedly the most prominent fact in the physiological action, it does not seem improbable that the adrenals may prove useful in all those clinical conditions in which vaso-motor tone is reduced; the author has therefore directed his observations somewhat specially in this direction with the view of determining whether or not this therapeutic forecast is verifiable. The conclusion which he has formed is, that a supra-renal preparation is undoubtedly valuable in affording tone to the vaso-motor system. He has elsewhere shown that in asthenia and in anemia the vaso-motor tone is as a rule reduced, and as a consequence the blood gravitates into the veins of the abdomen and of the lower part of the body when the patient assumes the upright posture—sitting and standing; in this way blood is withdrawn from the upper part of the systemic circulation in these postures, and returns to it when recumbency is assumed. Hence his arteriometer has shown that the most reliable test of the impairment or loss of vaso-motor tone is afforded by the radial artery, the diameter of which falls in the sitting and rises in the recumbent posture, whereas in a state of health the normal arterial tonus more than counterbalances the effect of gravity and permits a much larger radial calibre to be maintained in the sitting and active postures than obtains in recumbency. He has accepted this reversed radial calibration in posture, when habitual, as a general clinical guide for the prescription of the supra-renal treatment. He has observed that, as a rule, in the course of a few days' treatment the normal relation of the radial calibre to posture is restored, and that it is maintained as long as the supra-renal preparation is continued. In some cases it was pushed so as to set up a decided degree of plus arterial tension, quite recognizable by the finger. Guided by the means of observation employed, the author, therefore, concludes that supra-renal treatment is of considerable value when the tone of the vaso motor system is reduced, as at the menopause, in neurasthenia, and in anemia. Inasmuch as the administration of the gland raises the arterial tension, he has naturally avoided it in all the conditions in which plus arterial tension is present.

He has observed that supra-renal treatment produces two favorable effects in anemia: it restores the reversed postural variation of the arteries which as a rule obtains in this condition, and it frequently raises the percentage of hemoglobin. Perhaps the second effect springs in great measure from the first; for the maintenance of the larger arterial fullness in the active posture may favor the generation of blood-corpuscles in consequence of the blood being thus kept more freely distributed to the red marrow areas and prevented from drifting unduly into the abdomen, where the corpuscles may undergo too rapid destruction. However, whatever the explanation, the fact remains that in certain cases of anemia he has observed a rapid rise in the percentage of hemoglobin during the supra-renal treatment.

As the inquiry advances he hopes to determine whether supra-renal treatment increases the generation of new corpuscles, and whether it is of greater value in some forms of anemia than in others—positions which his preliminary observations support. He is disposed to think it is of some promise in the treatment of pernicious anemia—not merely because of the anemia *per se*, but because it may arrest the multiple capillary hemorrhages which are believed by some to play a prominent part in the production of the anemia. Then, besides, there is a not very improbable connection between some forms of anemia of obscure origin and impairment of supra-renal function, however produced. Dr. Douglas Stanley refers to cases of anemia in which the red blood-corpuscles and the hemoglobin are markedly reduced, the spleen and sometimes the liver enlarged, while the white corpuscles remain unaltered or are actually reduced in number, and in which there is pronounced asthenia and sometimes pigmentation of the skin. In such cases Dr. Stanley has observed that a freshly prepared extract of the supra-renals produces a marked increase in the number of the red corpuscles.

The author has treated two cases of cyclic albuminuria. In one the albumin gradually diminished, and at the end of three weeks disappeared, returning when the tablets were discontinued. In the other—a much more pronounced case—the albumin greatly diminished, and hopes are entertained that it will completely vanish on the further continuance of the treatment. In both cases the general health improved and the reversed radial measurements in posture were restored. Cy-

clic albuminuria probably depends on reduction of vaso-motor tone, the reduction being, however, so pronounced in the renal vessels that the mere assumption of the erect posture suffices to determine the transudation of albumin into the urine, which as a rule ceases when gravitation no longer operates, as in the recumbent posture.

Dr. Pavy is of opinion that "a vaso-motor paralysis implicating only the vessels of the chylopoietic viscera may stand at the foundation of the form of diabetes limited to defective assimilation of ingested carbohydrates." From the observations he has made on the pulse in diabetes, Oliver regards this position as highly probable, with, however, the qualification that in addition to the paresis of the visceral vessels there is usually a reduction of vaso-motor tone throughout the whole system. Inasmuch as the supra-renal active principle incites contraction of vessels by direct action on the muscular fibres, it is just possible it may find an appropriate application in diabetes. Last winter the author made observations on the effects of supra-renal tablets in three cases of diabetes in University College Hospital: in two the reversed radial calibration was rectified and the glucose was diminished, but in the third case the daily discharge of glucose was not appreciably affected. The preliminary observations are sufficiently encouraging, he thinks, to suggest further inquiry in this direction.

He has had one mild case of diabetes insipidus under observation in which the tablets are improving the general health and preventing the reversed radial diameters, but as yet they have produced but little effect on the average daily discharge of limpid urine (100 ounces). A case of diabetes insipidus favorably treated by ingestion of supra-renal glands is reported by Dr. Walter P. Clark in the *British Medical Journal* of May 18, 1895.

From his observations on the effects of the thyroid and supra-renal extracts on the circulation and the blood, the author is disposed to regard them as somewhat antagonistic, the former enlarging the arteries and reducing tension, while the latter produces contrary effects. If, therefore, the circulatory disturbance of exophthalmic goitre is largely the result of autogenic thyroidism, perhaps the addition of an excess of supra-renal material to the blood may serve to antagonize it. He has had but one opportunity of testing this surmise in a preliminary way—in a mild case in University College Hospital under the care of Dr. Bradford. The pulse-frequency was reduced, the reversed radial measurements were restored, and the thyroid gland and exophthalmos lessened. How far these beneficial results arose from mere rest in bed and how far from the supra-renal treatment, he cannot say.

Inasmuch as there is some resemblance between the physiological effects of the adrenal active principle and those of the digitalis group of remedies, the application of the supra-renal treatment to cases of cardiac disease in which the ordinary remedies have failed suggests itself. As yet, however, no satisfactory opportunities have presented themselves.

In the earlier part of this inquiry the remarkably pronounced constriction of the arteries and arterioles produced by the extract suggested the possible application of it as a hemostatic agent. Subsequent observation has, however, led the writer to somewhat modify that therapeutic forecast; for during the acme of the supra-renal effect on the circulation there is almost always observed an increased flow of blood from cut surfaces, or the recurrence of hemorrhage from them which had quite ceased before the injection was made. This effect was, of course, due to the enormous increase of blood pressure. But the rapid production of the cardio-vascular effect—which indeed may be appropriately termed a cardio-vascular storm—witnessed in the laboratory is one thing, while the more slowly induced clinical influence derived from the ingestion of the gland in the stomach is quite another. Still, the increment of blood-pressure which may follow the exhibition of large doses of the gland would, of course, contra-indicate the remedy in active hemorrhage, or in hemorrhage from any but the smallest arteries and capillaries. In all probability, therefore, if the adrenals are found to possess any therapeutic value in this direction, it will be in the limitation and arrest of capillary hemorrhage, such as occurs in pernicious anemia, in splenic leucocythemia, in purpura, scurvy, etc. Clinical opportunities have not yet arisen to enable the writer to test this point.

His observations have shown that the therapeutic effects of supra-renal treatment are induced but slowly and gradually—that, in fact, as a rule they are not so apparent at first by ordinary modes of observation as to enable the observer definitely to recognize them. Gradually, however, the arterial tension increases until the finger can clearly appreciate it. But he has observed that from

the first the supra-renal effect on the arteries may be definitely traced by the pulse instruments — especially the arteriometer — which initiated this inquiry and which have enabled him to study the clinical side with much greater precision and satisfaction than would have been possible without their aid.

CLIMATIC TREATMENT.

In a leading article in the London *Lancet* for Sept. 23, 1895, the profession are reminded of the dangers which may attend advice given in any routine or offhand fashion, or without adequate knowledge, to sufferers from phthisis. Climatic treatment is a large subject, which is beset with peculiar difficulties and needs special study if it is to be applied with discrimination and effect. It means much to the patient, is usually productive of decided benefit or injury, and the failures of such treatment often entail much misery on the patient and the patient's friends, and a corresponding amount of discredit upon the medical adviser. There are few catastrophes in practice more deplorable than to send a patient suffering from advanced or subacute phthisis on a long sea-voyage or to some distant health resort, only to perish miserably far from the comforts and consolations of home. Such a result may no doubt be in some cases unavoidable and may be reckoned among those "calamities of medicine" which we must all be prepared to face. But, on the other hand, there is no reason why a result of this kind should be anything but the rare exception if the medical adviser is thoroughly well posted in the principles which should regulate this department of practice. It is only fair to point out that the fault not uncommonly rests with the patient rather than with his adviser. Some patients go abroad without medical advice or in direct contravention of it, and it need hardly be said that it is most unjust to hold the profession responsible for the results which follow.

The first question which the practitioner has to consider in dealing with phthisical patients anxious to try a change of climate is, whether any change is desirable, or whether the patient should not rather remain at home. It is comparatively easy to define the cases in which the patient may be freely advised to try climatic change and those in which he must be dissuaded from what is a hopeless venture; the real difficulty is with the cases that are on the border-line. We may say with confidence that if the amount of disease is small, localized, and not progressive; if there is little or no wasting and fever; if the general health, and especially the integrity of the digestive system, is well maintained; if there are no complications; and if the patient is of a cheerful disposition and not averse to the prospect of foreign travel,— then there can be little hesitation in advising climatic change, and the only question will be to decide what change would probably be most beneficial. On the other hand, if the damage to the lung is extensive and progressive, if there is much wasting and fever, if there are marked constitutional breakdown and serious complications, then climatic change must in the great majority of such cases be forbidden, or, if permitted at all, only to a limited extent and merely as a palliative measure. These principles are, we think, clear and do not require argument or proof. The difficulty, as we have said, is chiefly with the intermediate cases. What amount of pyrexia or wasting should be held to contra-indicate climatic change in a case otherwise calling for it? In a doubtful case shall we attach more weight to the nature of the local lesion or to the constitutional symptoms? How far shall we allow the family history to govern our decision, or the existence of special symptoms, such as hemoptysis? We do not imagine that these questions can be answered very definitely, and much must always depend upon the practitioner's insight, common sense, and capacity for penetrating to the real nature of the case before him; but we may throw out a suggestion or two. The medical adviser called upon to deal with these cases will seldom regret relying to a considerable extent upon the thermometer. An evening temperature that is persistently above 100° should, as a rule, be held as a contra-indication for distant travel. Anything like severe pyrexia must be regarded as an absolute contra-indication. The practitioner should, also, attach much weight to the known history of the case, and should therefore be much on his guard with cases that he sees for the first time and of which he has no precise history. A case may present a very small local lesion, and yet the temperature or the general constitutional enfeeblement may point to the probability of a rapid progress of the disease, and hence to the futility of climatic change. Family history may also be important in this regard, but it is difficult to appraise it correctly; it is probable that its importance has been often overrated. The stage of the disease is, in

our judgment, of much less importance than the amount of lung involved and the type of the case. Thus, a case in the first stage with progressive lesion and much fever may be wholly unsuitable for climatic change, whereas a case with a single cavity, where the constitutional state is good, often does well. Much weight should be attached to the patient's capacity for taking and assimilating ample nourishment. The maintenance of nutrition is the keynote of the successful treatment of phthisis, and the prognosis may be allowed to be materially affected by the state of the digestive system. Hemoptysis or night-sweating may be proper ground for delay, but do not in themselves constitute any contra-indication for climatic change. It is not true that patients are more prone to hemorrhage at the high-altitude stations or at sea than they are at home.

Every suitable opportunity should be taken for impressing upon patients that the proper time for climatic change is when the disease is threatening rather than actually declared. It is, we conceive, the simple fact, deplorable as it is, that at present in the vast majority of cases the proper time for applying climatic treatment with effect is allowed to pass, and that treatment is commonly reserved for a stage of the disease when its success is always precarious and its failures many. On the other hand, its success in the early incipient stage of the malady is often great and brilliant. Early diagnosis is of supreme value in this matter and cannot be too earnestly insisted upon. We have not space in this article to enter upon the second part of the subject, viz.: Climatic change being deemed suitable, what shall be the nature of that change? This is a very large subject, on which it would not be possible to say anything of value with sufficient brevity. The sea voyage, the high altitudes, and the dry inland plains like those of South Africa now divide the title of supremacy. They are all most useful in their place, and we are gradually learning to distinguish the cases most suitable to each.

DISEASES OF THE ANUS.

A very practical article on this topic is contributed to the *Practitioner* for October, 1895, by GOODSALL, in which he first tells us that abscess of the anus may be due to an inflamed follicle, in which case it is often associated with other abscesses. An ischio-rectal abscess pointing in the anus is usually single, unless it is due to the burrowing of a fistula on both sides of the rectum, or to a rectal stricture with ulceration, or to a foreign body which has perforated the intestine on two sides.

The abscess cannot be opened too soon. The incision which gives the most satisfactory result is the T-shaped, with its horizontal part parallel to the anus. The three ends of the incision should extend beyond the cuticular margin of the abscess cavity. Hemorhage can always be arrested by carefully packing the incision with dry iodoform cotton-wool, and a pad and T-bandage. About four hours after the abscess has been opened, the patient should sit in water as warm as he can bear, for about half an hour; this will greatly soothe the part; if the cotton-wool packing retains its position despite the bath, it may be left *in situ*, but if it comes away it need not be renewed. Boric acid fomentations should now be constantly applied until the abscess has healed or until it is clear that a fistula will result. Abscesses in this part of the body are generally not opened soon enough, and when they are opened the single incision made is frequently far too small. When the abscess is seen early and opened freely, it seldom causes a fistula, and often heals very quickly.

Cancer commencing in the anus is rare. When seen at or near this point it is almost always connected with a malignant growth inside the rectum.

Eczema is frequently met with, and is one of the common causes of irritation of the anus. It is caused by lack of cleanliness after defecation, by constipation and the frequent passage of flatus and rectal mucus, or by the discharge from a fistula or wound of the part. The eczema may involve only the anus and the skin immediately adjacent, excepting over the coccyx and sacrum, in which direction it frequently extends for three or four inches and causes much discomfort in walking, especially in hot weather; or it may extend in severe cases over both buttocks, the scrotum, pubes, lower part of the abdomen, and some distance down the inner sides of both thighs. These various eczematous excursions usually occur in patients whose general health is not good.

The following is a good remedy when the surface is inflamed and cracked:

℞ Pulv. zinci oxidi, gr. lx;
Liniment. camphoræ, f℥ j;
Liniment. calcis, f℥ vj. M.

The part having been previously cleaned with olive oil and dry cotton wool, the liniment should be gently rubbed over the surface

for about five minutes, and a layer of dry absorbent cotton wool applied. When the surface has become dry, the following powder will, in many cases, if the cause of the eczema has been removed, complete the cure:

℞ Pulv. zinci oxidi,
Pulv. gum. camphoræ, āā gr. lx;
Pulv. amyli, ʒ j.

The part should be cleaned every night and morning, and after an action of the bowels, with olive oil and cotton wool, and the powder gently rubbed over the eczematous surface.

In severe cases of eczema it is necessary to combine with the above local treatment a thorough change of air and food.

An external opening is generally well marked and easily seen. Sometimes, however, it is concealed by a fold of redundant or edematous skin, or it may be so small as to be only visible when discharge is escaping from it. When the opening cannot be seen, it may be found by passing the left index finger into the rectum and then gently pressing the anal region between the left index finger and thumb. If a complete or blind external fistula is present, the pressure on it will nearly always cause some discharge to escape at the external opening, and so indicate its position. From the external opening the sinus can be felt running towards or communicating with the rectum. The sinus feels like a cord in the subcutaneous tissue. When a fistula is frequently gathering and breaking, and therefore causing much pain and discomfort, the patient may be greatly relieved by enlarging the external opening by a T-shaped incision. This treatment necessitates only a few hours' rest on a couch or in bed, and prevents any immediate extension of the fistula; in the majority of the cases it almost, if not quite, stops the pain and greatly diminishes the discharge; it will also enable the patient to postpone, if necessary, the operation for the complete cure of his fistula.

Fistula is to be looked for when the patient complains of a burning, aching, or throbbing pain in the anus, coming on during or within half an hour after the action of the bowels, more especially when the motion is firm and hard. The pain may last from only a few minutes to several hours—the general duration is from two to four or six hours,—ceases more or less suddenly, and seldom recurs again until during or after the next action of the bowels. Patients observing this, and to avoid a recurrence of the pain, frequently allow their bowels to be unrelieved for two or more days. In many cases blood is lost only occasionally, and then only a smear; but when the patient has both a pile and a fissure, he may lose much blood at each action of the bowels.

On examination, the anus will be found contracted in appearance, and the patient, when asked to force the part down, will generally be unable to do so. Frequently there is a small fold or tab of skin at the outer margin of the fissure. In four out of five cases the fissure will be found in the middle line dorsally or just to the right or left of it, and in the majority of the remaining cases in the middle line anteriorly or just to the right or left of it.

On examining the rectum, the finger will find its entrance resisted by the spasmodic action of both sphincters; the rectum will frequently be found more or less full of feces, and a growth or growths or a polypus will be met with in the lowest inch.

When the fissure is recent and there is not a polypus or a polypoid growth, it may be cured by treatment with aperients and diet only. The bowels should be relieved at least once in the twenty-four hours, the motions being either liquid or quite soft. The anus should be carefully bathed with warm water after each action of the bowels, and a suppository—ol. theobromæ, gr. xv, frequently answers extremely well—should be passed into the rectum both before and after each action of the bowels.

When the fissure is of long standing, or when there is a growth, polypus, or internal pile, the external sphincter should be divided, and the growth, polypus or pile removed. After this has been done, a permanent cure can be safely promised. In some cases of old-standing fissure the external sphincter becomes hypertrophied and loses much of its normal elasticity, thereby reducing the orifice of the rectum. In such cases, even when the fissure has cicatrized, defecation is very difficult and painful unless the motions are relaxed or soft. When the motion is firm, the pieces passed may be not more than half an inch in diameter, or less, and frequently the patient has to go to the closet more than once before he can get any relief at all. In these cases, when the fissure has cicatrized, the pain does not last for any length of time after the action of the bowels. This condition can be relieved by forcible over-stretching of the sphincters, and it may still more certainly be cured by complete division of the external sphincter on one side

only. Patients who will not submit to stretching of the sphincters or to the division of the external sphincter will gain some relief by injecting into the rectum one ounce of olive oil every night at bedtime. The oil should, if possible, be retained all night. For the first three or four nights some of it may escape during sleep; later on there is usually complete retention of the oil during the night. Generally, as soon as the patient gets up, he has to pass the oil, and later on it is followed by a soft and well-lubricated motion.

Edematous skin is caused by prolapsed and strangulated internal piles, stricture of the rectum, ulceration of the rectum, blind internal fistula, abscess, cellulitis. When caused by internal piles, the latter should, if possible, be immediately returned into the rectum, and the following lotion constantly applied until the edema has disappeared:

℞ Liq. plumbi subacetatis, f℥ ss;
Sp. vini rect.,
Glycerini, āā f℥ j;
Aquæ rosæ, f℥ xij. M.

It is best to keep the patient in bed for a week.

When the edema is caused by stricture or ulceration of the rectum, the same lotion may be used, but it will not do so much good until the stricture has been dilated or the ulceration cured.

When the edema is caused by a blind internal fistula, it will be quickly got rid of by making a free T-shaped opening externally into the fistula.

When the edema is caused by an abscess or cellulitis, the abscess should be opened freely at once; and when cellulitis is the cause, two or more crucial incisions should be made at once completely through the edematous tissue. The incision will bleed very freely at first, but the hemorrhage can be arrested and much relief can be given to the patient by bathing the part with water as warm as the patient can bear it. No ligatures need be used to stop the bleeding. Cases in which the hemorrhage is allowed to gradually cease, assisted only by bathing the part with warm water, appear to progress much faster than when the hemorrhage is immediately arrested with ligatures, clips, and plugging.

Redundant skin occurs as a single fold or tab in cases of fissure; as one or more folds in cases of internal piles, both before and after operation; after some cases of ulceration of the rectum; and in old cases of eczema. Provided the cause has been or can be removed, the best treatment is to snip off the greater part of the folds of skin with a pair of strong and sharp scissors. No other treatment will cause them to disappear. While they are allowed to remain they always cause more or less difficulty in keeping the anus clean, and will frequently cause or keep up irritation of the part.

The most common forms of syphilitic disease of the anus are mucous tubercles, ulcers, or fissure and gumma. When the secondary forms of syphilis are present, the diagnosis may be confirmed by examining the penis or vulva for the sore or induration left by it, by finding the inguinal or femoral glands on one or both sides enlarged and more or less freely movable, by finding signs of syphilis on the tongue and fauces, and especially just at the back of the last double teeth and on the cheek adjacent to them. Occasionally there may also be a rash on the body. It is extremely rare to get secondary syphilis of the anus without also getting one or more of the above signs. Mucous tubercles cause itching of the anus during the daytime, and a burning pain at night, coming on when the patient is asleep and disturbing his rest. They are sometimes painful for a few minutes after an action of the bowels, and the part may bleed when the motions are firm. The following powder, if carefully and regularly applied, is very useful:

℞ Hydrargyri subchloridi, ʒ j;
Pulv. gum. camphoræ, ʒ j;
Pulv. amyli, ʒ iv. M.

The patient should be directed to remove all old powder and secretion before fresh powder is applied; otherwise he will probably not do so. A mixture of perchloride of mercury and iron should be administered, or, still better, an inunction of unguentum hydrargyri fortior, gr. xx, to be rubbed in every night, and the following mixture to be taken two or three times a day:

℞ Ferri sulph., gr. iij;
Magnes. sulph., gr. xxx;
Acid. sulph. dil., ♏ v;
Glycerini, f℥ j;
Infusum quassiæ, q. s. ad f℥ j. M.

When iron is given at the same time that mercury is either ingested or rubbed in, salivation or tenderness of the gums is seldom caused by the mercury, although its specific action on the syphilis is not diminished. With the above treatment the patient may, in the majority of cases, continue to follow his usual occupation all the time he is using the remedies.

In cases of syphilitic ulceration or fissure of the anus the unguentum hydrargyri subchloridi should be used instead of the powder recommended for mucous tubercles.

Gumma is occasionally met with near the anus or just outside the ischio-rectal fossa. Care must be taken not to treat the gumma as an abscess. With large doses of iodide of potassium it is slowly absorbed. The cases usually occur in elderly patients with more or less broken-down constitutions, requiring good food, rest, and change of air, as well as medicinal treatment.

The writer has so far never seen a primary syphilitic sore of the anus.

Chancroidal ulcers or soft sores are generally multiple and secondary to sores in the vulva. They may be cured by the application of a ten-per-cent. solution of cocaine, followed by the thorough application of sulphate of copper, especially round the margin of the ulcer. After the slough has separated, the ordinary red lotion or a sulphate-of-copper lotion—two to four grains to the ounce—should be applied. This treatment is sufficient in many cases, unless the patient also has syphilis.

Venous piles or thrombi, when large, are tense and dark-blue in color; when small, the color is only seen by making the skin tense over the clot. They may be multiple or single, and vary in size from a damson to a pin's head. They are found close to the anal orifice, and often extend to just inside it. They are usually caused by straining in the act of passing a hard fecal mass or lifting a heavy weight. They come suddenly. The patient complains of pain when the bowels are relieved, also of itching, soreness or tenderness when walking and sitting. The bowels should be relieved once or twice a day by aperients, and the lead-and-spirit lotion recommended for edematous skin should be kept constantly applied. This treatment usually relieves all discomfort in from twenty-four to forty-eight hours, and the blood-clot will be absorbed in about three weeks from its commencement.

When the clot is large and on the point of making its way through the skin, it is better treatment to lay open the pile and turn out the clot. When this is done, the overhanging skin should be removed; if left, it will become swollen, and may be painful for several days. The quickest treatment is to remove an elliptical piece of skin, about one-fourth to three-fourths of an inch in extent, from the most prominent part of the pile, with a pair of scissors, and to then dissect out the blood-clot. This can be done without rupturing the capsule in which the clot is contained. Pressure should be applied until all bleeding has ceased; the sides of the incision should then be carefully adjusted to each other, and a pad of absorbent cotton wool applied. The bowels should not be relieved for forty-eight hours; by this time the part will, in most cases, be found soundly healed.

Verrucæ should be removed with a pair of scissors. The left index finger having been passed into the rectum, the anal region can be made tense between the finger and the thumb so that only the wart, and none of the skin, shall be removed. After the warts have been removed, the zinc, camphor, and starch powder should be applied for a few days.

THE KIND OF CERVIX THAT REQUIRES TRACHELORRHAPHY.

In an article with this title, GILES tells us, in *Clinical Sketches* for November, 1895, that while he readily grants that in certain appropriate cases repair of a torn cervix may be followed by disappearance of general nervous symptoms, he has so little confidence in the value of this or any other operation for the cure of nervous disorders, as such, that he leaves this aspect of the question altogether, and confines his remarks to the indications for trachelorrhaphy afforded by definite local conditions.

When a cervix is torn (as during labor), the raw edges become healed over by granulation and cicatrization, but, as a rule, without uniting. The resulting fissure, even if deep or bilateral, does not necessarily give rise to symptoms: for the cervical mucous membrane may gradually acquire the characters of the vaginal epithelium; the external os retreats, as it were, towards the internal, while the anterior and posterior lips of the cervix become in reality lips or lappets, which can be readily separated to a greater or less extent. A cervix in this condition is not uncommonly discovered when a vaginal examination is made on account of other symptoms; and we may admit, as a general statement, that a laceration that has healed over does not, as such, require repair.

If general neurotic symptoms coexist with such a condition, an attempt to cure them by local treatment will be almost certainly a failure.

But the lesion may take a less favorable course. The exposed cervical mucous mem-

brane may become unhealthy, either alone or as part of a general endometritis; it then becomes congested, and the lips separate—the tendency to separation is exaggerated by a marked coincident flexion of the uterus; the everted mucous membrane is then bathed in the unhealthy secretions (arising partly from the uterus) found in the vagina; and it is but a short step from this condition to that of erosion, with the formation of the retention-cysts known as Nabothian follicles. The congestion and edema of the cervix commonly spread to the body of the uterus, which becomes heavy, elongated, and enlarged, resembling the condition found in subinvolution. With the chronic endometritis and metritis so produced is frequently associated prolapse of the ovaries into Douglas's pouch, especially when there is also retroflexion. The ovaries share in the congestion and become unduly sensitive. The usual symptoms complained of under these circumstances are: abundant leucorrhea, sacral aching, a feeling of weight and "bearing down" in the pelvis, and dyspareunia.

We have here in outline the picture of a case requiring the operation of trachelorrhaphy. Yet this must not be done at once; a little preparation is necessary. First, the patient should be kept in bed for ten days if circumstances allow; meanwhile the congestion is relieved by the usual applications of tampons and douches. The uterus should be restored to its place when this is possible; and one or more applications may be made to the endometrium, according to the extent of the endometritis. In some cases these measures will suffice for relief, or even temporary cure; but in any case this stage should be arrived at before repair is attempted, otherwise there is risk of non-union, and so of failure of the operation.

As to the method of repairing the cervix, there are various unnamed modifications of Emmet's original plan. The following is one of the simplest; it is practiced by Dr. W. H. Fenton, and is performed with the aid of a double reversible hook devised by him. This instrument may be described as consisting of two tenacula hinged together, one of which is, as it were, bisected longitudinally so as to form two hooks side by side. The single blade works between these parallel limbs. When the handles are slightly approximated the hooks look towards each other like a volsella; by further approximation the hooks first meet, the single one between the other two, and then diverge so as to look away from each other. Thus the one instrument serves either to separate the two lips of the cervix or to hold them together.

The Operation.—After the usual preparations, the patient is placed in the lithotomy position, an Auvard speculum is placed in the vagina, and the vagina is douched. Curetting may next be done, but if the preliminary treatment above described has been properly carried out this should be unnecessary. The double hook is then introduced between the lips of the cervix, and its two limbs separated. It should be placed so that the hooks are inserted into the median line of the lips. When these are everted so their inner surfaces lie almost in one plane, a flap is dissected off each side as follows: The scalpel is carried from front to back, parallel to and a little to one side of the median line; the two ends of this incision are connected by a curved incision carried round the margin of the lips. Similar incisions are made on the other side. Then, commencing at one corner, each flap is dissected off. The tissue that is left between them is to form the mucous membrane of the new cervical canal. During the dissection of the flaps a certain amount of blood escapes, which has the effect of diminishing the volume of the cervical lips; and these, even though they looked at first far too bulky to meet, now fall readily together on the removal of the instrument. When the lips have been brought into apposition, the double hook is reapplied by being placed with one limb in front of the cervix and the other behind, still in the median line. Thus the lips are conveniently held in position while sutures are passed through, three or four on each side. For this purpose a slightly curved needle on a handle is convenient; but, if preferred, Hagedorn's needles may be used. The material may be silver wire, silk, or silkworm-gut. Tightening and securing of the wire is done by means of Aveling's shot and coils. This is especially useful when the cervix cannot be brought low down, and when, in consequence, tying is difficult. But my preference is for thick silk, which is less liable to cut through, and from which there is no risk of irritating the vaginal walls. As the last step of the operation a sound is passed, to make sure that the cervical canal is not blocked up. The operator need not be afraid of making the external os too small, for it is always found later to be larger than it was left at the time of operation. The vagina is packed with iodoform gauze.

As regards the after-treatment, it is best to keep the vagina as dry as possible; but if there should be discharge, irrigation is required, and after each irrigation the vagina should be dried. The sutures are removed at about the tenth day; for this purpose the patient should be placed in a good light, preferably in the lithotomy position.

The author has seen and practiced this operation at the Chelsea Hospital for Women in about a dozen cases, and the results are very good.

When seen several months later the cervix presents the rounded conical appearance which is the normal form; and there is little chance of recurrence, especially if the two sutures nearest the median line have been properly secured.

Further, when the operation is undertaken for the reasons here given, the relief of all the symptoms is most satisfactory—a result which does not uniformly follow when it is performed for the relief of nervous disturbances.

MERCURY IN HEART DISEASE.

In the London *Lancet* for September 28, 1895, MURRAY states that he has been somewhat disappointed in the discussion at Edinburgh on cardiac stimulants, inasmuch as hardly any reference was made to the value of mercury in cases of heart disease. Views on this subject have not advanced of late, and the mind of the profession has not grasped the idea that mercury has a value in heart disease far beyond what may be termed its "alterative" action. The administration of this drug in cardiac dropsy and in all cases of passive congestion of the pulmonary and portal systems is as old as the hills, and the old-fashioned physicians know well enough that thirty or forty years ago no one thought of treating these conditions except by a mercurial pill followed by a saline or jalap purgative and a diuretic mixture containing digitalis. Then came the days when the diuretic mixture was changed for one of muriate of ammonio-citrate of iron with digitalis, and some of us remember the remarkable papers of Dr. Handfield Jones on the value of this combination. Now we have come to the days of arsenic, strychnine, iodide of potassium, and a host of cardiac stimulants, together with rest and cardiac gymnastics. In all cases our remedies do but assist nature in bringing about healthy compensatory changes by preventing degeneration of the muscles and vessels of the heart and the main blood-vessels. Repeated observation has convinced the author that mercury possesses a value far beyond the supposed alterative nature of its action—not that it fails to relieve congested vessels by drainage or osmosis, for it would fail to relieve the heart did it not eliminate biliary and other effete matter from the blood and tissues of the liver and portal system, for instance; but when due allowance has been made for these primary effects, there remains strong evidence that it tells upon the heart itself. Its special benefits are exercised in cases of dilated and hypertrophied heart. By means of it the "thready," weak, rapid and irregular pulse is made full, soft, regular, and slow, with manifest relief of such symptoms as dyspnea, pectoral weight and tightness, and sensations of faintness. The "angina sine dolore" is often marvellously relieved or removed by two or three grains of blue pill three times a day, and the severe forms of "angina pectoris" not seldom disappear under its influence. While the nitrites, nitroglycerin, etc., afford temporary relief, this remedy is much more permanent in its effects. To give digitalis a fair chance, it is absolutely necessary to pave its way by preliminary doses of mercury, and to foster its action by repeated doses. Many of the failures, or apparent failures, under digitalis, etc., are due to the fact that no blue pill or calomel was given, and it often falls to the lot of the consultant to make a great hit by inserting the mercurial into the previous treatment. Much more true is this of iron and digitalis combined. We see a patient with engorged vessels and laboring heart taking iron and digitalis, much to the detriment and not to the benefit of the case; each dose is but adding fuel to the fire—energizing the heart in its futile attempts to drive the blood through the engorged vascular system, and thus exhausting the organ in its hopeless struggle. We change all this by frequently repeated doses of mercury; we drain the portal system, we exosmose the water from the general vascular system, we suck up dropsical accumulations, and by pushing the drug we get hold of the heart itself and produce the slow, soft, regular, and effectual pulse, giving the digitalis or strophanthus a fair chance to come in as a cardiac tonic; and at last we complete the circle by arriving at the point whence we started with the patient in a very different condition, and we can give the iron and digitalis now with impunity—nay, with immense benefit. Let the following case speak for itself, and its citation is the more

apt as the patient came from being under the care of an eminent Edinburgh physician in the very condition I have described, viz., a dilated and hypertrophied heart goaded to excess in a useless effort by iron and digitalis.

The patient, a hard-working Scotchman, had all the talent, physique and energy peculiar to his race. He gradually developed symptoms of valvular disease and dilated heart when about forty-eight years of age. He went to Edinburgh and was under treatment there for several weeks. At last he was sent home with the assurance that nothing more could be done for him. Dr. Wilson, of Wallsend, was summoned to see him, and called the writer in consultation on the case. They found the patient in the following condition: Propped up in bed; countenance anxious, eyes seeming to protrude from their sockets; face bathed in perspiration; lips and skin livid; breathing shallow, frequent, and difficult, accompanied by a constant hacking and ineffectual cough; pulse hardly perceptible, irregular, thready; heart's action tumultuous and irregular, the cardiac sounds almost inaudible, and a distant murmur could be heard with both sounds at both the right and the left apex; no cardiac impulses could be felt except a wavy movement at the epigastrium; the liver was enlarged, and the abdominal cavity was distended with fluid, as were also the lower extremities and the scrotum; the pleural cavities also were occupied to a considerable extent by fluid effusion.

The physicians determined to abandon the usual cardiac stimulants, and gave two or three grains of blue pill thrice a day, and at the end of two days a smart purge of jalap. Greatly encouraged by the result, they pushed the blue pill (two to three grains three times a day) for a week or more, and during that time a steady relief of all the symptoms ensued: the countenance became placid, the tongue (before dry and brown) moist, and the pulse more regular, full, and soft; the dropsical accumulations gradually receded, and the breathing resumed a normal character. Now was the time for digitalis—always best given on a falling tide in dropsy,—and doubtless the patient owed much of his rapid recovery to the temporary and occasional use of that drug; but the staple of the treatment was the steady use of blue pill, now gradually diminished to two pills a day, and finally to a five-grain pill at bedtime. The man felt himself to be quite free from all his troubles in six weeks; from this time he resumed his duties and became a useful and active member of society.

Now the point of interest in this case is, that during the next ten years the patient stuck to his blue pill every night, with few intermissions, and declared that whenever he did leave it off for a few nights his heart began to trouble him and his breathing became difficult. As will be seen from the post-mortem notes, this nightly dose was in some mysterious way enabling a heart massive with disease to discharge its duties in such a way as to make its owner feel quite well. During the ten or eleven years of his subsequent life, Dr. Wilson calculates, he took 20,000 grains of blue pill; it never salivated him, it neither purged nor nauseated him, and never gave his breath a touch of fetor. At last, however, his old symptoms returned, the machinery was worn out, and he died chiefly from the pressure of abdominal fluid on his enormous heart.

The post-mortem examination revealed an enormously enlarged heart—the space occupied by it measured eight inches across and eight inches from above downwards; the lungs were displaced backwards and compressed by it. The right auricle was very much dilated, its muscular tissue hypertrophied; the auriculo-ventricular orifice was very much increased in size, readily admitting eight fingers at once; the tricuspid valves much thickened and opaque; right ventricle much dilated and its walls thin. The left auricle was much dilated, walls thick, endocardium opaque; in one part of the wall of the auricle there were two bars of calcified muscular tissue united by a crossbar of the same substance; the auriculo-ventricular opening was much constricted and hardly admitted the tip of the index finger; the mitral valves were adherent, so that there was only a small opening like a button-hole between them. The valves were thick and rigid, but not calcified. The left ventricle was dilated, but its capacity was only about one-half that of the right; walls not much increased in thickness. The peritoneal cavity contained a considerable amount of clear fluid. The spleen showed a dense white patch of scar tissue one-fourth of an inch deep in the centre—evidently the site of a very old infarction. The surface of the liver was nodular; on section it showed dense strands of connective tissue of advanced cirrhosis.

The author remarks that to rescue a man from the jaws of death and give him ten or

eleven years of fairly good health confers on any drug a reputation. Its potency is established. We therefore ask: How does it act? Is it a cardiac tonic, stimulant, alterative, or what? Or does it act on the secondary apparatus of the circulation and the blood itself by reducing the resistance of the vessels, diminishing the volume of blood, and altering its fibrinity so as to make it circulate more freely? I think it does all these things, and at the same time it soothes the heart by purifying the blood of effete accumulations.

HEMORRHAGE AFTER REMOVAL OF THE TONSILS.

In an interesting editorial in the *New York Medical Journal* for November 16, 1895, the causes and dangers of this accident are discussed.

The amygdalotome, or tonsil guillotine, in one or another of its multifarious forms, is to be found in almost every general practitioner's armamentarium, and it is to be feared that few who possess it feel any hesitation about resorting to its use, no matter what may be the features of the enlarged tonsil or the peculiarities of the patient. There seems to be a general impression that ablation of the tonsil by means of the guillotine is free from danger. It is in consequence of this impression, perhaps, that, as Dr. William H. Daly, of Pittsburg, said in a recent discussion of the subject before the American Laryngological Association, there has been "more bad surgery done upon the tonsils than upon any other part of the human body."

This discussion followed the reading of a paper by Dr. John W. Farlow, of Boston, entitled, "Some Remarks on Removal of the Tonsils." Dr. Farlow made a particular point of the danger of hemorrhage after the use of the guillotine, especially in adults and in cases in which the tonsil was large and tough. Dr. Farlow's statement that "very many cases of troublesome bleeding occur which are never reported" should not pass unheeded, or his other statement that "in delicate children every drop of blood may be valuable." Dr. Farlow was supported by every speaker who took part in the discussion. Dr. Bosworth, of New York, after citing Guersant's statement that in 5000 amygdalotomies he had never seen severe hemorrhage, added the significant comment that Guersant's cases had all been in children. Dr. Ingals, of Chicago, said that he was well aware of the danger from bleeding when the amygdalotome was used, for he had seen a number of trying instances of the kind. Dr. Daly placed himself on record as saying that "the man who pinned his faith to the statement that there was no danger of hemorrhage in amygdalotomy would sooner or later meet his Waterloo," and added that he deserved to meet such a fate for relying upon worthless statistics. He himself had met with several cases of alarming hemorrhage, and gave a striking sketch of a case in which he had made an appointment to remove the tonsils from a farmer's son, but had learned on his arrival at the house that the boy was out on the farm, whereupon he went out and met the boy in the woods and did the operation then and there, with the result that he "had to spend several hours with his fingers in the patient's throat to arrest the hemorrhage." Dr. Casselberry had had enough cases of serious hemorrhage to make him "cautious and somewhat anxious" about every patient operated upon with the amygdalotome, and he was not sure that such hemorrhages might not occur in children; indeed, he knew of a fatal case in a child, three years old, whom there had been no reason to regard as a "bleeder." Dr. Shurly had had two very serious cases of tonsillar hemorrhage in children. Dr. Murray mentioned an instance in which the patient had nearly bled to death.

If this is what skilled laryngologists have to say of the tonsil guillotine, the general practitioner may well be cautious in its use. If the tonsil must still be subjected to surgical procedures as often as it has been in the past, at least let those procedures be made as free from danger as possible, either by substituting a crushing for a cutting instrument, as advocated by Dr. Farlow, or by taking away "only enough of the projecting portion to relieve the mechanical obstruction and the pressure and irritation produced," which Dr. Shurly has found sufficient.

ABSORPTION FROM THE BLADDER, URETHRA, AND VAGINA.

In an original research on this subject, WALSH discovered the facts given below and which he has published in the *University Medical Magazine* for September, 1895. He thinks that his experiments warrant the conclusion that the bladder does absorb; and he endeavored to determine, if possible, why other experimenters had failed in a good many instances to find absorption. (See

THERAPEUTIC GAZETTE for January, 1896, page 28.)

Küss and Susini's experiments with the solution of ferrocyanide inside the bladder, and the iron salt on the outside, though quoted approvingly by physiologists, are absolutely of no value as regards absorption. To be absorbed, a substance need not find its way through all the coats to the peritoneal surface. Once through the vesical epithelium, it finds in the muscle the open lymphatic spaces ready to carry it into the system through the lymph-channels.

Absorption is eminently a vital quality; to kill the animal is to stop at once all the vital processes, especially the lymph movement which brings about absorption. Osmosis may still go on through dead animal membranes; but this is very different from the vital force that causes absorption, though it has been often confounded with it.

The somewhat similar experiments of Cazeneuve and Livom with recently removed bladders, and the test for urea in the water in which they were placed, may be criticised in the same way. They were studying the difference in imbibition between the recently dead bladder-walls kept in a state somewhat resembling the natural one by immersion in warm water, and the bladder-walls rendered porous by rigor mortis,—but not absorption from the bladder.

Bert and Jolyet and Alling found that on tying the urethra at the neck of the bladder they got no absorption from the bladder; and with very good reason. They had seriously disturbed or effectually tied off the lymphatics leading from the bladder—the paths by which any substance would find its way into the system from the bladder. Sappey, in his "Description et Iconographie des Vaisseaux Lymphatiques," says: "In the dog and rabbit, the lymphatic trunks run from the urethra, they curve back to the right and left and go on to terminate in the glands situated below the external iliac vessels." A ligature at the neck of the bladder would almost surely include them, and so cut off all possibility of absorption.

As to the absorption taking place from the urethra, not the bladder: First, experiments seem to show that the posterior urethra absorbs scarcely better than the bladder itself. Second, where a proper-sized catheter is used, there is not likely to be any dribbling into the urethra during the experiment; and any that comes out after the catheter is withdrawn is immediately ejected. Third, where the drug is well diluted, as it was in all their experiments, and followed always by at least five cubic centimeters of water, to clear the drug from the catheter, not enough of the solution could possibly stay in the canal to produce the characteristic effect of the drugs, as noted in the experiments. Finally, as to injury inflicted on the bladder-walls by catheterization: where this is done carefully and gently, it scarcely seems possible. The animals bear it without any manifestation of pain, they do not need to be tied, and one person can do the catheterization unassisted. For smaller animals it could be urged with more probability, but for good-sized dogs it seems unreasonable to say that they are injured by every insertion of a catheter.

Susini's experiments with potassium iodide directly on the bladder of dogs have been shown to be conclusive by Ashdown, who demonstrated that, injected into the bladder, it was eliminated by the kidneys. As to the experiments with potassium iodide and belladonna on his own bladder, not enough of the drugs was employed to allow for the accumulation in the system which is necessary to give the symptoms of their intoxication.

The last series of experiments by direct injection of poisonous substances into the bladder, performed by Drs. J. Boyer and L. Guinard, seem to have been done with a great deal of care. The negative results obtained by them can only be attributed to the fact that they used doses not sufficiently large. To a dog of sixteen kilos they gave fifty centigrammes of cocaine. Now, a dose of .03 gramme per kilo (which would be, for a dog of this size, forty-eight centigrammes) has been known not to kill a dog when injected directly into a vein. It is not very surprising, then, if the much slower absorption of the same dose from the bladder should fail to give noticeable symptoms. Morphine has to be used in very large doses to affect dogs, and Boyer and Guinard used it in the very ordinary doses of ten centigrammes. Of pilocarpine, they used ten centigrammes for a dog of sixteen kilos, and twenty centigrammes for one of eighteen kilos. The toxic dose by the vein is given as four centigrammes per kilo (that would be, for dogs of the sizes given, sixty-four and seventy-two centigrammes respectively). The dose they used was very small, and any noticeable symptoms could scarcely be expected.

For atropine, dogs have an idiosyncrasy, and stand the drug very well; ten centigrammes for a dog of nineteen kilos is a

very small dose. The toxic dose by the vein should be about eight times that amount. Veratrine was also used in too small doses; more than twice the amount per kilo than they used has been known not to kill a dog when injected into a vein.

There remain the experiments with strychnine. Five centigrammes of strychnine, even in the bladder, ought to give serious symptoms, and ten centigrammes ought to be absolutely fatal. The author's own experiments with much smaller doses gave distinct symptoms. Most of Ashdown's experiments were done with strychnine, and he never failed to get results with much smaller doses. Bazy, in contradiction to whose experiments Boyer and Guinard undertook theirs, did several experiments with strychnine in public after the publication of their article, so that there remains no reasonable doubt that it is absorbed from the bladder.

Absorption is a matter of lymphatics, not of epithelial cells. The various forms of cells lining different parts of the respiratory, digestive, and genito-urinary tracts play mainly a protective part for the lymphatic structures beneath. That in some places they have a heightened activity, and seemingly a selective action in absorption, is true; but at no part do they absolutely prevent absorption. Even the cutaneous epithelium, with its horny epiderm, will allow the passage of a number of substances. Rapidity of absorption, then, depends on the richness of the lymphatic structures in a part, and not on the character of the mucous membrane covering it. The lymphatics in the bladder are not numerous, but they are easily demonstrable. Absorption should take place, then, though not rapidly.

Absorption from the vagina is more rapid than from the bladder, and this is in accordance with the richness of its lymphatic supply. If we were to consider absorption as dependent on the character of the epithelium, the many-layered, stratified, transitional epithelium of the vagina, almost cutaneous in character, would seem to be capable of effectually preventing all absorption. The difference in character between the epithelium of the first inch and that of the rest of the anterior urethra has no effect on its absorptive power.

The bladder absorbs somewhat slowly the drugs that are injected into it, but it has a true absorptive power.

The urinary constituents, water and solids, are, to a certain extent, reabsorbed from the bladder when allowed to remain in it for some time.

The anterior urethra absorbs more readily and rapidly than the bladder; the posterior urethra, about as the bladder does.

The vagina absorbs very readily ordinary drugs injected into it.

TREATMENT OF ACUTE SEPSIS OCCURRING AFTER LABOR AND ABORTIONS, TO PREVENT ITS EXTENSION, OR FROM CAUSING PERMANENT INJURY.

GILL WYLIE, in the *New York Medical Record* of September 21, 1895, discusses this important topic. He is of the opinion that what may be called the fashionable methods now being resorted to, and so ably advocated by some, are very radically defective when applied to any but fresh and rather superficial septic uterine infection. He refers to curettage and gauze-packing, as it is called. Of course, in all cases where possible, the uterus should be emptied, but there is an erroneous belief and teaching now very prevalent, that sepsis is caused by retained placenta, and that all that is needed is to curette this out and pack the uterus with iodoform gauze. It is true that retained placental tissue and clots make a very favorable nidus and food for septic germs, but uninfected placental tissue will not cause sepsis. Of course it should be removed, and it is very important to remove or give free drainage to all effete tissue when once the septic germs become active; but sepsis will, as we well know, start up and kill when there is no such thing as a placenta about.

Now as to drainage: Loosely packed gauze drains well in ordinary cavities where the secretions or excretions are thin and watery; but the uterus has in it many glands and follicles which secrete or excrete, especially when irritated or inflamed, a thick gummy material, which after a few hours soon chokes drainage through gauze, and what escapes passes around and in spite of, and not through, the gauze. Besides, the uterus is a contractile organ with a very powerful sphincter guarding its mouth, and as soon as contractions begin this constricts the gauze and obstructs drainage. In all cases the uterus should be carefully emptied, but the combined method of the hand or fingers and forceps is preferable where practicable. After removing with forceps all large pieces, Wylie very carefully runs a large-sized curette over

the surface to bring away small adherent pieces; but soon after labor and abortions, especially when the tissues have been rendered soft and patulous from sepsis, it is an easy matter to push a small curette entirely through the uterus, as has not infrequently been done. Again, if after the first chill and rise of temperature from puerperal sepsis, in most cases, if one empties well the uterus of all clots and retained placenta, and all material favorable to the rapid development of sepsis, one good antiseptic washing out and loose packing with gauze will check the sepsis, and in many cases effect a cure; but where there is failure to effect a complete emptying of all, or almost all, of the effete material, or at least that part of it already infected by sepsis, curetting and the foregoing method of gauze-packing will not effect a cure even when supplemented by one washing out; and when it fails, the gauze left in over twelve or twenty-four hours increases the danger to life by tending to keep the septic material in the uterus, and a close packing with gauze tends to force the sepsis into the sinuses, veins, or Fallopian tubes. In cases of sepsis which have existed for several days, the curettage and gauze-packing is much more likely to fail, for the sepsis has had time to penetrate deeper into the uterine tissues. Of course, when the septic material has entered the peritoneum or is located in the veins or lymphatics outside of the uterus, no local treatment of the uterus can effect a complete cure.

We will assume that the septic material, the centre and source of the infected matter, is still within the uterus and has not yet infected the peritoneum nor the lymphatics and veins outside—for experience teaches us that this localization generally continues for many hours, and often for two, three, and four days, or more. In all cases unless we can clearly detect local sepsis within the peritoneum, the lymphatics, veins, or some tissue outside of the uterus, we must at once act on the assumption that it is confined to the uterus, testing the matter by actual emptying and local treatment of the uterine cavity. The method the writer proposes, practiced fifteen years ago, has proved to be more reliable than the method now known as curettage and gauze-packing.

Called to see a case of puerperal fever, it will not do to examine and, finding a laceration of the perineum or cervix, to assume that a small open wound, except in rare forms of septic poison, such as true diphtheria, can cause the symptoms of a severe or dangerous puerperal sepsis. After washing out the vagina and cleaning off and cauterizing with pure carbolic acid any torn or lacerated tissue, a few times, unless there is rapid and continued improvement the author soon resorts to washing out the uterus (which will as a rule be found patulous and readily dilatable in septic cases) with a solution of 1:40 of Calvert's No. 1 carbolic-acid solution. Beginning cautiously and carefully, he gives the whole cavity a soaking wash of two quarts or more; then with his hand, fingers, and forceps where practicable, he empties the uterus of all clots and effete material. If it is an old case, he first dilates the os well with steel dilators, but never with tents of any kind, and after running a large-sized curette over the surface to get off all small adherent tissues he swabs out well the whole cavity with pure carbolic acid rendered soluble with a little glycerin and water, and immediately follows this up by washing out the uterus with a hot solution of carbolic acid, 1:60, injecting a quart or more. If the uterus is large and very patulous he uses a large-sized Chamberlain's glass tube, but in all other cases and after the first washing or two he invariably uses a large-sized No. 12 or 14 old-style stiff-gum catheter. He introduces the catheter, with a stylet in it, well up to the fundus; then he fills the catheter with water after removing the stylet, and connects it with the ordinary Davidson's syringe. Beginning his injection very slowly, and gradually turning the catheter about in the uterus, he pumps the water with full force as soon as it begins to run out of the vagina freely. He aims to completely flood the whole cavity and use not less than from one to two quarts of 1:60 solution of Calvert's No. 1 carbolic acid. Immediately after the first washing out in acute or severe cases the patient will have, as a rule, a chill and rapid rise of temperature, which is undoubtedly due to increased absorption from the fresh wounds to the mucous membranes by the instruments used.

The reason he uses the catheter is that it can be readily adapted to any size or position of the uterus, which often hardens up and flexes sharply as soon as the sepsis is checked, though poison may not yet be completely eliminated and is liable to develop again and renew itself in full force. Glass tubes often fail to reach the fundus after a few washings. Double-recurrent and other theoretical contrivances often fail to do more than wash out a small section of the cavity by running in at

one eye and out at the other, and those fine contrivances which aim to forcibly distend the uterus or vagina before emptying the fluid are very liable to force the septic material through the Fallopian tubes into the peritoneum. It takes an expert to reach the fundus and wash out efficiently as the uterus begins to contract; and failure to wash out or kill all germs means a relapse.

To empty the uterus and wash it out is very important, but unless the first washing is followed up by another washing in about one hour after the first is finished, and especially if an interval of three or more hours is allowed to intervene, the treatment will utterly fail in many cases—in fact, in almost all except very fresh and simple cases—of septic infection. In from three to eight hours the germs left have found effete material to develop on, excretions and mucus cover the surface, and almost all of the original local sepsis has been reproduced. Thus it is essential to wash every hour, until the escaping fluid is practically clear of all—especially all dark-colored—material, and the temperature has fallen to or near normal. As the water returns clearer and clearer the temperature sinks gradually, and, as a rule, after five or six washings the temperature is near the normal mark and will remain so. If the temperature does not materially fall after five or six washings, then the fever is kept up by other sources of septic infection, and we must find them and when practical must operate to get rid of the sepsis.

The author has tried different antiseptic solutions in washing out the uterus, and prefers 1:60 to 1:100 solution of Calvert's No. 1 carbolic acid. It is safe, does not constringe the parts, and soaks into the tissues and softens them. It is possible that the carbolic acid enters the circulation and acts favorably, but it is its local action that he relies upon. If more than six hours' washings are required to control the sepsis, he uses alternately a solution of boric acid. If the urine be watched, there is no danger of carbolic-acid poisoning, for the urine becomes smoky and plainly indicates that the carbolic-acid injections should be stopped or at least lessened. In old indolent sloughing cases he uses peroxide of hydrogen or iodoform, and usually inserts a large hard-rubber intra-uterine drainage-tube. Bichloride of mercury cannot be used safely except in weak solution, 1:5000, and not too often; besides, it constringes the tissues and interferes with free drainage and insertion of the tube.

STUDIES IN ANESTHESIA AND ANESTHETICS.

KEEFE writes under this title in the *Boston Medical and Surgical Journal* of November 28, 1895. He thinks if there is any suspicion of weak heart, the patient should be put under the influence of digitalis for twenty-four hours, and given a hypodermic of four grammes of the tincture before beginning the inhalation.

Every one administering an anesthetic should measure the dose Fifteen grammes (or half an ounce) of chloroform is a proper dose to produce anesthesia in an adult, and should be poured on at once, and no more should be used except as needed to continue the anesthesia.

Forty-five grammes (or 1½ ounces) of ether is enough for a woman, and sixty grammes (or two ounces) is enough for a man, and should be the charging dose. There may be an exceptional case where even sixty grammes will not subdue a patient, but such an one should be considered not a good subject for ether, and chloroform should be substituted or added.

The face, pulse, and respiration, in order named, should be watched attentively during chloroform-administration, and the respiration and pulse in ether.

It is not enough to see that the chest moves; we must hear the air enter the lungs.

A good plan is to combine chloroform with ether, especially if one fears to assume the responsibility of using chloroform; and twelve grammes (or three drachms) of chloroform and thirty grammes (or one ounce) of ether is a good charge and can be depended upon to produce anesthesia. In this way the stage of excitement so common in ether anesthesia is avoided.

Withdrawal of the anesthetic, the frequent momentary inversion of the patient, artificial respiration, strychnine, heat, digitalis, the galvanic battery, and sponging or sprinkling of face and breast with ice-water, are the means for restoration of function arrested by anesthetics.

THE FORMATION OF BLOOD FROM INORGANIC IRON.

Of the few physiological chemists in this country, none stand higher at home and abroad than CHITTENDON, who, in the *Dietetic and Hygienic Gazette* for November, 1895, states editorially that hardly any one question in physiological chemistry has provoked more discussion than that suggested by the

above title. Will the iron contained in ordinary inorganic preparations be absorbed from the intestine, and can it be utilized in the formation of hemoglobin? The question has been asked many times in the past, and the answer is at least implied in the fact that in older handbooks of therapeutics the inorganic preparations of iron constitute the sole remedies in chlorosis. Of late, however, there has been a growing conviction that, in the formation of hemoglobin within the body, only organic iron compounds can be utilized —such, for example, as are found in the ordinary foodstuffs.

That inorganic iron compounds can be absorbed from the intestine, at least to a certain extent, is seemingly proved by the experiments of Professor Kunkel, of Würzburg, and his results have been recently confirmed by Woltering, of Utrecht, who also claims that the absorbed iron is built up into peculiar organic compounds in the liver. Kunkel, who has taken up the subject anew, considers that there are two questions which need to be definitely settled before we can positively assert that the organism is able to build up hemoglobin out of inorganic iron:

A normally nourished mammal contains in its liver a certain store of organic iron compounds which unquestionably serve as a reserve material for the more or less continuous formation of blood going on in the body; and especially to supply the needs of the system whenever there arises any necessity for increase in the production of hemoglobin, as after loss of blood by bleeding, etc. This being so, we need to know whether the iron compounds found in the liver in increased amount after feeding with iron salts are identical with this normal reserve material. Secondly, is hemoglobin actually formed out of the iron compounds which result from the absorption of inorganic iron salts from the intestine?

These questions Kunkel has attempted to answer in the following manner: An animal was fed with an abundance of nourishing food containing all the elements necessary for the needs of the body, being deficient only in iron, and every week a quantity of blood was withdrawn sufficient to materially change the composition of the blood but not to endanger life nor interfere with functional power. The iron withdrawn after this manner with the blood was determined by chemical analysis. Pursuing such a method, it is easy to withdraw from the animal more iron than it can absorb from the food, thus rendering the body poor in iron and the blood poor in hemoglobin. Now, if, with such an animal, the feeding of inorganic salts results in the blood becoming normal again in its content of iron, it follows that the hemoglobin must be formed, indirectly at least, from the inorganic iron.

The food used in the experiments was exclusively cow's milk, which contains on an average only one milligramme of metallic iron per liter. The animals were two young dogs of the same litter, and with a body-weight of 2000 and 2300 grammes respectively. They were fed daily on 750 grammes of milk, on which they flourished and gained fat. Dog B received only the milk, while dog A was given daily in addition thirty drops of a solution of albuminate of iron, equivalent to 4.4 milligrammes of metallic iron. The experiment was continued through seven weeks, each animal being depleted of about one-third of its blood every week. In this way, at the end of the seven weeks each animal had lost about two and a half times as much blood as it possessed at the beginning of the experiment. The following abbreviated table gives a *résumé* of the results obtained from the analysis of the blood of the two animals:

DOG A, WITH IRON.

	Blood withdrawn.	Fe_2O_3 in the Blood.
First week	44.2 Gm.	0.0215 Gm.
Second week	45.9	0.0178
Third week	54.3	0.0192
Fourth week	58.1	0.0194
Fifth week	53.3	0.0194
Sixth week	59.6	0.0229
Seventh week	39.6	0.0138
	355.0	0.1340

Iron taken in six weeks, 0.30870 Gm. Fe_2O_3.
Iron taken in seven weeks, 0.36015 Gm. Fe_2O_3.

DOG B, WITHOUT IRON.

	Blood withdrawn.	Fe_2O_3 in the Blood.
First week	50.6 Gm.	0.0227 Gm.
Second week	54.2	0.0273
Third week	56.0	0.0145
Fourth week	63.3	0.0192
Fifth week	54.3	0.0127
Sixth week	51.0	0.0116
Seventh week	21.5	0.0042
	350.9	0.1122

Iron taken in six weeks, 0.04410 Gm. Fe_2O_3.
Iron taken in seven weeks, 0.05145 Gm. Fe_2O_3.

From these results it is seen that dog B lost in the blood withdrawn 112 milligrammes of ferric oxide, while in the food consumed during the period there was contained only 44 milligrammes of ferric oxide. In this animal anemia was very marked. Dog A,

on the other hand, which had lost somewhat more blood, containing in all 134 milligrammes of ferric oxide, showed no signs of anemia, a result which can be explained only on the assumption that the animal had absorbed a portion of the iron of the albuminate and utilized it for the production of new blood. This supposition is made still more probable by the following facts: One week after the withdrawal of the last portion of blood, both dogs were killed by ether and all the organs freed from blood by injecting through the aorta 0.8-per-cent. salt solution until the fluid came through colorless. While, obviously, all the blood cannot be removed in this manner, full seventy per cent. can be obtained. The blood and washings were then united and the content of iron determined, and the more important organs were likewise analyzed for iron, with the following results:

DOG A, WITH IRON.

Weight of the animal, 3150 Gm.

	Fe_2O_3
The blood contained	0.0404 Gm.
The liver contained	0.0317
The spleen contained	0.0043
The kidneys contained	0.0025
The ribs contained	0.0011

DOG B, WITHOUT IRON.

Weight of the animal, 3300 Gm.

	Fe_2O_3
The blood contained	0.0252 Gm.
The liver contained	0.0043
The spleen contained	0.0013
The kidneys contained	0.0014
The ribs contained	0.0001

These data, showing as they do such a marked difference in the amount of iron in the tissues of the two animals, are explainable only on the assumption that the dog A had absorbed a certain amount of the iron preparation given him with the food, utilizing it for the production of new hemoglobin.

Especially noteworthy is the comparatively large amount of iron found in the liver of the dog fed with the iron albuminate. It would seem to be plain that the liver has the power of picking up and retaining within its tissue a certain amount of iron which is destined to serve as a store of this material to aid in the manufacture of new blood whenever it is needed by the body. This view, indeed, is in close harmony with many facts—such, for example, as the liability to severe anemia after diseases of the liver.

Further, in the examination of the ribs of the two animals, the red medullary matter only being examined, it is to be noted that even macroscopically there was a wide difference in their appearance. Thus, in the dog A the medulla had the characteristic red color, while in dog B it was only faintly colored—a difference which is quite in harmony with the content of iron found on analysis.

Without considering the results more in detail, it is plain that Kunkel has given us some very interesting data, which seemingly verify the ability of the system to utilize such compounds as the albuminate of iron for the manufacture of hemoglobin and the production of new blood.

There is another matter brought out experimentally in these results, which is perhaps worthy of a moment's consideration, viz.: the wonderful power of reconstruction possessed by the system. Thus, the dog B in the first four bleedings lost 214 grammes of blood. Now, originally, before the animal was bled at all, the total amount of blood in the body could not have amounted to more than 170 grammes; hence, in these three to four weeks there must have been a reconstruction of blood amounting to a quantity considerably in excess of the whole volume present in the body at the beginning of the experiment. Yet the animal was able to accomplish all this in a short period of time without any noticeable deterioration or strain upon the system.

Whether inorganic iron is as readily utilized by the body in the production of hemoglobin as organic iron, such as ferruginous nucleo-albumins, hematogen, etc., is a question not considered in Kunkel's work, but plainly the animal body can make use of inorganic iron in the absence of any more favorable material to work with.

RHUS POISONING.

In the *American Journal of Pharmacy* for January, 1896, BERINGER tells us that he has been a sufferer from this poisoning for years, but that during the past summer washing the face and hands with solution of hydrogen dioxide has been adopted as a preventive, with apparently good results. Hot soda baths have also appeared to be efficacious in the treatment of the disease, and, for a topical application he prefers the following lotion:

℞ Sodium sulphite, granular, 1 drachm;
Glycerin, ½ fluidounce;
Camphor-water, q. s. ad fac 4 fluidounces.

LUPUS ERYTHEMATOSUS TREATED INTERNALLY WITH PHOSPHORUS.

In the *Boston Medical and Surgical Journal* of November 28, 1895, JENCHES, of Galena,

Illinois, records his views on this topic and after describing the general treatment of a case in hand goes on to say: All external treatment was now abandoned, and the patient was given a solution of phosphorus prepared as directed by Professor Berkley in his article in the *American Journal of the Medical Sciences* for April, 1893, namely:

℞ Phosphorus, gr. vi;
Absolute alcohol, ʒ xxx.

To be dissolved with the aid of heat and agitation, and then mixed, while still warm, with the following mixture, also warm:

Glycerin, ʒ ixss;
Alcohol, ʒ iss;
Essence of peppermint, ʒ ss.

Each drachm contains one-twentieth of a grain of phosphorus.

Of this, twenty drops were at first taken in water three times daily, after meals, but the dose was gradually increased until at one time it reached forty drops. This amount did not produce any gastric disturbance, but the large doses were only taken for a short time. A few weeks after the adoption of this medication, the burning and tenderness were observed to be gradually disappearing; and as the color began to fade, the patient frequently remarked, "Ich glaube sie heben die recht Arzenein gefunden."

At the end of the second month of treatment the improvement was very noticeable; the dull-red color, previously so conspicuous, was passing off. At the end of five months of treatment the improvement was so great that the patient considered himself cured. The red, inflamed, and infiltrated condition had disappeared; the integument over the diseased area had assumed quite a healthy appearance, although in places it was somewhat scarred; the livid line of demarcation which had separated the diseased from the healthy skin was no longer perceptible.

After several years of ineffectual external treatment the lesions had yielded to the internal administration of phosphorus.

In the article previously referred to, Professor Berkley states that chronic cases of lupus erythematosus seem as much benefited by this treatment as do acute cases.

Judging from the well known action of phosphorus on the nervous system, the writer is led to believe that the lesion is of neurotic origin. In administering phosphorus the action of the remedy upon the digestive organs should be carefully watched, and if unpleasant symptoms arise they should be promptly met by appropriate treatment.

THE PHARMACOLOGY OF THE IPECACUANHA ALKALOIDS.

The Manchester correspondent of the THERAPEUTIC GAZETTE contributes a valuable paper on this topic to the *Lancet* of November 23, 1895. He reminds us that the active principle of the ipecacuanha root, "emetine," has been known to chemists since the early part of the present century, and its physiological action has been investigated by Magendie and many subsequent observers. The experimental results have in some cases been discrepant and at times even contradictory, so that doubt still exists as to the precise nature of the so-called "emetine" and its action upon the tissues. Considerable light has recently been thrown upon the cause of these discrepancies by the researches of Paul and Cownley, who have shown that the ipecacuanha root contains at least two distinct alkaloids, and that these exist in variable relative proportions in different varieties of the plant. They have also shown that the so-called "emetine" previously obtained by different chemists was not always the same substance; that obtained by Glenard consisted of one of the two alkaloids, while other methods yielded variable mixtures. Paul and Cownley have succeeded in separating two bases, the one soluble and the other insoluble in caustic alkalies, and have named them cephaëline and emetine, respectively; the latter is identical with the emetine of Glenard. These alkaloids have been prepared in a pure state, carefully analyzed, and their salts studied. They possess a definite composition agreeing with the formula $C_{14}H_{20}NO_2$ for cephaëline, and $C_{15}H_{22}NO_2$ for emetine; the latter alkaloid is thus the methyl compound of the former, the chemical relation between them being similar to that existing between morphine and codeine or between caffeine and theobromine. It is important to determine whether both of these alkaloids are active principles, and if so whether their action is the same or different in kind or in degree.

Both cephaëline and emetine possess a powerful emetic action; the emetic dose of the latter is, however, about double that of the former. In non-emetic doses the degree of nausea produced by cephaëline is also about double that produced by emetine—*e. g.*, the intensity and duration of the nausea following five milligrammes of cephaëline was much the same as that following ten milligrammes of emetine. Both alkaloids lower the arterial tension; little difference is apparent be-

tween the effects of small doses in this respect, but the depression produced by the emetic dose of cephaëline is less than that produced by the larger emetic dose of emetine; cephaëline appears, therefore, to be distinctly preferable where a non-depressing emetic is desired.

Both alkaloids caused contraction of the blood-vessels after destruction of the brain and spinal cord, but emetine was distinctly more active than cephaëline: 1 in 10,000 of the latter produced little if any effect, while 1 in 20,000 of emetine was followed by marked contraction. On the heart no appreciable difference could be made out; both alkaloids produced slowing, weakening, and diastolic arrest of the isolated organ; recovery was easily effected when the poison was removed. It is doubtful whether the drugs in the doses administered to men would affect the heart directly; but the fact that 1 in 20,000 caused diastolic arrest in forty-six minutes renders caution necessary in giving larger doses of the alkaloids. Both acted as muscle poisons, but cephaëline had the greater toxic power, and also caused irritation of the motor nerve-endings and contracture. As to the secretions, salivation was well marked wherever there was nausea. Emetine caused a flow of watery mucus from the nasal mucous membrane when a full dose was given; this was not noticed after cephaëline. It is possible that the expectorant action of ipecacuanha is due to a similar action of emetine upon the other portions of the respiratory mucous membrane. Intestinal peristalsis and a loose motion at times followed the administration of either alkaloid; there was never any marked purgation. No effect was noticed upon the secretion of the skin or upon the amount of urine.

Assuming the correctness of the view that emetine is methylcephaëline, it would seem that the chief effect of the addition of the CH_2 group is to markedly reduce the action of the compound upon the convulsive or vomiting centre in the medulla oblongata, and also to diminish the irritating effect upon motor nerve-endings. The methyl compound has, on the other hand, a more powerful action as a local vaso-constrictor. The addition of the methyl group does not appear to affect the other actions of the alkaloid. With regard to therapeutic use, only accumulated clinical experience can determine their relative positions. It seems probable that in cephaëline we have a powerful and certain emetic, singularly free from depressing effects when given in doses of from five to ten milligrammes (one-twelfth to one-sixth of a grain); its action, however, is too slow to prove of much service in cases of poisoning, but in all other cases where emesis is desired it appears well worthy of trial. In acute catarrhal and febrile conditions, as an expectorant, and for all the uses of ipecacuanha where vomiting is not desired, emetine in small doses seems likely to prove of considerable value, and also as an emetic in larger doses of from ten to twenty milligrammes (one-sixth to one-third of a grain) when a more depressing action is required. The powerful local constricting effect upon blood-vessels may also prove useful in hyperemic and inflammatory conditions.

The wide variations in the activity of the pharmacopœial preparations of ipecacuanha may not unlikely be due to variations in the quantities and relative proportions of the alkaloids which they contain, and the use of the pure alkaloids may render one of our most valuable remedies of still greater service.

GASTRIC LAVAGE WITH A CONTINUOUS CURRENT.

HEMMETER, of Baltimore, in the *New York Medical Journal* of December 28, 1895, contributes an article with this title, and concludes that the use of the stomach-tube is contra-indicated in all constitutional and local diseases in which the disease could be aggravated or life endangered by the irritation and exertion of lavage. Among these could be mentioned: pregnancy (though this is not a disease); heart diseases, in a state of defective compensation—heart neuroses, angina pectoris, myocarditis, and fatty heart in advanced stage; aneurysm of the large arteries; recent hemorrhages of all kinds, including apoplexies, pulmonary, renal, vesical, gastric, and rectal hemorrhage, and hemorrhagic infarctions; advanced pulmonary tuberculosis; advanced pulmonary emphysema with bronchitis; apoplexy and cerebral hyperemia; advanced cachexia; presence of continued or remittent fever.

The stomach and intestinal diseases which Boas states are contra-indications of the use of the tube are: ulcer, with recent hematemesis and dark stools; palpable carcinoma of the pylorus, with vomiting of coffee-ground material and the classical symptoms of cancer; many gastric neuroses in which the character of the malady is clear without lavage; stomach or intestinal troubles with

acute fever; gastric mucosa easily started to bleeding; secondary gastric affections whose dependence upon a distinct and more important primary disease is evident.

These are not invariable rules, however; there may occur cases under some of these exceptions when, on account of depressing self-intoxication from the stomach or advanced gastric fermentation, lavage is peremptorily required. Thus, according to Boas, it has been employed with success in pregnancy, and the author once washed out the stomach in a case of typhoid fever, with favorable result, and also greatly relieved a case of aortic regurgitation with Bright's disease and gastrectasia by the same means. Professor Moritz, of Munich, has frequently passed the stomach-tube in pregnant women to ascertain the intra-gastric pressure.

Although gastric pathology is emerging more and more from empiricism, and approaching an exact science based upon chemical, physiological, and pathological facts, still much depends upon the experience and judgment of the physician.

ANTIPYRIN AND TANNIC ACID AS A STYPTIC.

The following is from an article by Dr. ROSWELL PARK, of Buffalo, which appeared in the *Medical News* of November 16, 1895:

"In the *Medical News* of December 15 and 22, 1894, I rehearsed some of my experiences with antipyrin as a styptic in surgical practice, stating that I had for years used a five-per-cent. solution as a spray, sterilizing the water before making the solution. This I had no hesitation in spraying upon any surface, peritoneal, cerebral, or other, from which parenchymatous oozing was taking place to an extent complicating the operation or jeopardizing the success of an ideal dressing. This therapeutic note attracted at least sufficient attention to lead to its pretty general use by surgeons in various parts of the country, from many of whom I have heard commendatory remarks, and from none of whom have I heard of disappointment in its use. The present note is to corroborate the favorable esteem in which I have long held this procedure, and to state that I have since resorted to it more widely and more generally for styptic purposes. Thus, I have no hesitation in using it in the urethra, or even in the bladder, in cases of hematuria proceeding from either of these locations. Even in the eye it may be used without fear, preceding its use by that of a weak solution of cocaine, though in this location the antipyrin solutions need not be made so strong. On the other hand, it may be used in much larger percentage when the five-per-cent. solution fails to accomplish the purpose; even when small vessels spurt, compression for a few moments with iodoform gauze or acetanilid gauze sopped in this solution will often be effective.

"As every physician will realize, there occur cases of bleeding—for instance, from the nasal cavity or from divided bone—in which even these solutions will be ineffective. My present object is to call attention to the combination of antipyrin and tannic acid, in solution, by which there is precipitated an intensely agglutinative and cohesive substance, of (to me) unknown chemical composition, which offers the most ideal styptic for certain purposes that I ever dreamed of. This combination I hit upon by accident, and first resorted to in a case of apparently intractable hemorrhage from removal of adenoid tissue in the vault of the pharynx, to which I was called in consultation by Dr. Hinkel. He happened to have at hand a bottle of alcoholic solution of tannin, while I was provided with antipyrin in powder. The case being urgent, I suggested the combination of the two styptics, and added the dry powder to the solution. To our surprise, there was formed at once a gummy mass, at first flocculent, which quickly cohered, the result being a combination the stickiness and adhesiveness of which quite astonished us. A small sponge dipped into the fluid containing this material in suspension was inserted into the post-nasal space, and hemorrhage instantly was checked, not to recur.

"I have since experimented with these materials, and have found that they may be united in almost any proportion with the formation of the gummy mass, and would suggest that the substances be mixed in proportion to the emergency of the case, and to the desire for little or much of the resulting compound. It is possible, by adding strong solutions, or by pouring the powder of one into the solution of the other, to precipitate so much of the agglutinative composition as to make a gum that may be placed about the margin of the bleeding bone—for instance, in operations upon the cranium. Or a small piece of sponge or cotton sopped in this material may be forced into a tooth-socket, or in various other ways its use may be made to result in benefit and satisfaction. There is but one attendant difficulty—it is so re-

markably cohesive that when the time comes for detachment or separation of the tampon it is difficult to remove it. It may be even necessary to wait a sufficient time for the formation of granulations and separation by natural processes."

TREATMENT OF TETANUS BY ANTITOXIN.

In concluding an article in the *Boston Medical and Surgical Journal* of January 16, 1896, WITHINGTON gives us a summary of the recent literature of this subject, as follows:

Among the first to apply practically to tetanus the principles announced by Behring regarding the immunizing power of serum derived from animals rendered immune by progressively increasing inoculations of the toxin of a given disease, were Professors Tizzoni and Catani, of Bologna, in the laboratory of the Italian Ministry of Agriculture, Industry, and Commerce. Their product, consisting of the dried serum of the horse thus treated with tetanus toxin, was the first preparation of this sort, so far as the author is aware, put upon the market. It was furnished to the medical profession in tubes containing 4.5 grammes of the dried powder, at a cost of about five dollars per gramme. Naturally it required considerable faith to induce men to embark in so expensive a therapeutic venture, as the dose advised was 2.25 grammes at the outset for a mild case and the whole bottle for a severe case, with subsequent doses *pro re nata*. This dried serum was to be diluted with ten volumes of sterile water for injection.

A vigorous controversy was waged between Tizzoni and Huebner regarding the immunizing strength of Tizzoni's product, in which Huebner claimed that the antitoxin was so weak that the cures referred to it were not in fact due to it, and that the solid form in which it was dispensed laid it open to serious objection on the score of positive sepsis.

From the cases, now not very rare, which have been reported as having been treated by this remedy, Withington has selected the following somewhat at random, but including unfavorable as well as favorable results:

Drs. Giusti and Bonaisati had a cure of tetanus by this serum in a soldier twenty-two years of age. He developed tetanus twenty-three days after receiving multiple injuries. Two days later he received his first injection, which was repeated twice daily for eight days, when he became convalescent.

Dr. Marriott had a patient, a butcher, age twenty-eight, who was wounded in the jaw on September 24. Symptoms of tetanus appeared on the 30th, and six days later the first dose of antitoxin (2.5 grammes, Tizzoni's solution) was administered In all about twelve grammes, in multiple doses, were given, covering a period of fourteen days. Patient was convalescent four weeks after the first appearance of his symptoms.

Dr. Firth treated a case of tetanus neonatorum, developing five days after birth, with antitoxin injections, the first being given on the eighth day. Four injections were made, aggregating two grammes; no relief was experienced, and the child died when ten days old, shortly after receiving an injection.

Evans reports the case of a boy of fourteen, cut on the right knee on June 8. Tetanic symptoms first appeared on July 16. Treatment by serum injections (Tizzoni's material) was begun on July 26. He received a number of injections between that date and August 9, aggregating less than 4.5 grammes, and was well soon after August 15.

Dr. Henry Percy Dean reports a case of traumatic tetanus, developing twenty-four days after a wound (but not necessarily so long after the infection, as the patient had been working in the ground with the wound insufficiently protected). The patient, sixteen years old, was given his first injection of 2.25 grammes of tetanus antitoxin, July 27, five days after his first symptoms; and between then and August 7 he received more than twenty-four injections, aggregating 15.75 grammes of the antitoxin. Recovery was completely established about September 1.

Von Hacker had two cases of tetanus which recovered under the use of Tizzoni's serum. The first, a groom, age twenty-two, developed tetanus three days after a wound of his hand; on the fourth day, injections of serum into the arm were begun, and these were continued till 8.88 grammes had been used. He was well eighteen days after the first injection. A boy, age fifteen, developed lock-jaw thirty-seven days after a wound of his thumb; five days later he received antitoxin for the first time, and after 4.05 grammes had been given and sixteen days after treatment was begun he was quite well.

Bauer reports a case of tetanus unsuccessfully treated by antitoxin. It was, as he points out, an exceptionally acute and fulminant case, therein differing from the subacute or chronic cases which had been generally reported by others as cured. His patient,

age twenty-six, had his first symptoms of tetanus July 11, seven days after a punctured wound of the sole. The next day, July 12, he was admitted to the hospital, and at 5 P.M. received an injection of 2.25 grammes of Tizzoni's material. Seven and a half hours later he died in a severe convulsion, probably from spasm of the diaphragm.

Another unfavorable result is that reported by Schwartz. The patient was admitted to the hospital July 29, after only two days' illness. On the 30th he received 2.25 grammes of Tizzoni's antitoxin, and five grammes at each of the three subsequent doses. Although he came in with severe convulsions, these gradually diminished and finally ceased altogether. But he died suddenly of cardiac paralysis. The curious thing about this case was that with the diminution and cessation of the spasms there was yet a constant increase of the temperature till it reached 40.3° C. just before death, and 41.1° C. one hour after death. This writer remarks that there are two types of death in tetanus: the one occurring at the height of the convulsive paroxysm; the other in which the convulsions decrease, with rapid rise of temperature and pulse just before death. He considers tetanus to be properly an afebrile or at most a subfebrile affection, except at this prelethal stage. In his own antitoxin case he queries if the abnormality of a high and continuously rising temperature is not referable in some way to the antitoxin used.

In the *Archives of Pediatrics* for December, 1895, Dr. J. Lewis Smith refers to four cases of tetanus neonatorum treated by Tizzoni's antitoxin, with incubation periods after birth respectively of two, nine, one, and seven days, of which only the last recovered. As to the general statistics of tetanus sero therapy, he quotes a letter of Mr. Hewlett, which is perhaps the latest summary of the statistics, and which says: "I have been able to collect records of forty-two cases of tetanus treated with antitoxin, nearly all traumatic, and of these fifteen died and twenty-seven recovered, giving a mortality of about thirty-six per cent." (See THERAPEUTIC GAZETTE, December, 1895, page 811.)

THE OPERATIVE TREATMENT OF THE DISEASES OF THE ANTRUM OF HIGHMORE.

FREEMAN (*Journal of the American Medical Association*, Nov. 30, 1895) holds that when an empyema of the maxillary sinus is due to disease of a molar or bicuspid the tooth should be extracted under nitrous oxide gas, and the cavity reamed out to admit a tube four to six millimeters in diameter, thus enabling the surgeon freely to irrigate and medicate the cavity. The most desirable apparatus for drainage is a gold tube, with a collar fastening it securely to a neighboring tooth. Where it is necessary to clear up the diagnosis as to the presence or absence of a foreign body or growth, exploration through the canine fossa is proper. The opening should be large enough to allow the introduction of the finger, and is easily accomplished by means of a drill. After carefully exploring the cavity, removing any cause of irritation, curetting if necessary and breaking down bands, a light iodoform-gauze packing is applied. The author advocates packing daily with thymol gauze for a week, and then fitting an obturator of metal or hard rubber, which is held in position by the pressure of the cheek. Introduction of tubes of small calibre into the antrum for drainage is perfectly futile, since the muco-pus is too thick to escape through them.

The intra-nasal irrigation and drainage route is usually to be preferred to the oral. Treatment through the middle meatus is to be condemned. Operations through the wall beneath the inferior turbinal are of real value. Mikulicz makes an opening three-eighths of an inch broad by five-eighths of an inch long, far up under the inferior turbinal, where the wall is usually quite thin. Through this large opening the pus can drain quite freely into the nose, although the perforation is at times some distance above the floor of the antrum. It is not, however, an operation to be undertaken lightly, for the pain without total anesthesia is considerable, and the hemorrhage frequently demands tamponing of the nares for twenty-four or forty-eight hours. This operation is to be ranked with that through the canine fossa for severity, while it is inferior in that it allows no examination of the interior of the sinus. Even with so large an opening, some patients are unable to cleanse the cavity themselves.

Less objectionable, though still possessing serious drawbacks, is the method of Krause. He penetrates the outer wall of the inferior meatus far up and back with a strong curved trocar and cannula, washes the cavity once, and insufflates iodoform. But he puts nothing into the opening to maintain its patulency, and so every second day the cannula, armed with an obturator, must again be forced into

the cavity. If one considers how rapid the healing of such punctures is, and the great tendency there is for granulations to form, he will realize that this treatment constitutes really a series of operations which must be done under cocaine. Bloch objects on the ground that the opening is extremely difficult to find. While some of Krause's cases are cured in a few weeks, others require months of treatment, and few persons could be found in this country to submit to such an ordeal. Another objection is that the patients are unable to carry out the treatment themselves. Again, both Krause's and Mikulicz's instruments are too large to be used in making a trial puncture, so that the diagnosis in obscure cases must be confirmed by another method before undertaking theirs.

While many ingenious methods have been devised for the intra-nasal operations, one very important thing seems to have been overlooked, viz., a simple and practical means of keeping open the perforation, so that the treatment may be readily carried out by the patient as well as the physician. To overcome this objection has been the writer's principal aim in the operation presented below. In suspected cases of empyema it is often necessary to irrigate the cavity, as first proposed by Ziem, to determine whether pus be present. While he prefers to make the puncture through the alveolus, the majority of operators lean to the intra-nasal position. Lichtwitz goes so far as to make a trial puncture under the inferior turbinal, and, finding pus, operates on the sinus through the mouth. Following him, the author also uses a straight trocar and cannula, but, instead of making the opening in the Mikulicz-Krause position, he perforates low down and more anteriorly. The nasal duct lies thirty to thirty-five millimeters from the naso-labial junction, and, unless it opens in a furrow, its exit is high up under the turbinal. Freeman keeps close to the floor of the nasal fossa, which at times necessitates penetrating thicker bone, but this is quickly and almost painlessly done, and the disadvantage is compensated by entering the cavity near its bottom and thus securing better drainage, while the risk of injury to the tear-duct is avoided and a resting-place for the head of the tube is obtained inside the pyriform aperture. The inferior turbinal and naso-antral wall beneath it are first anesthetized with ten-per-cent. cocaine solution. Using special trocar and cannula, a few taps with the mallet cause it to penetrate the wall, the entrance into the antrum being unmistakably recognized by the absence of further resistance. Withdrawing the trocar, warm sterilized normal salt solution is at first gently, later with considerable force, syringed through the cavity. Should the water return perfectly clear, even after repeated flushing, the cannula can be removed and no harm results. The author emphasizes repeated flushing; in one case he used over a pint of water before obtaining a trace of pus, but finally washed out a pus cast of the cavity, the presence of which had caused a marked edema of the eyelids on that side. When pus is present, however, he does not remove it at once, but re-introduces the trocar, withdraws the cannula, slips a drainage-tube over the trocar till it penetrates the cavity, and, withdrawing the trocar, completes the washing of the sinus by syringing through a long silver tube which accurately fits the permanent tube. If pus is now obtained, the tube has been correctly placed. The antrum being thoroughly cleansed, air is blown through to dry it, and then an antiseptic powder is insufflated. The operation, including cocainization and treatment, takes but eight minutes, and few complain of any pain. The physician should treat the case for the first few days until the nose becomes accustomed to the tube; later the patient can learn in a minute to pass the wash-tube and cleanse the cavity for himself.

Before undertaking any operation on the antrum, its position should be determined by grasping the three points forming the antral triangle—the thumb in the canine fossa, the first finger on the malar process, and the second finger on the edge of the orbit. Within these boundaries must lie the antrum; and, knowing this, one can hardly go astray.

The set of instruments necessary for this operation consists of a trocar and cannula, silver drainage-tube, and a mallet; for irrigating the cavity, a wash-tube, syringe, and rubber tube with connections. The drainage-tube may readily be cut down to fit the case. The cannula is steel, as softer metal splits in penetrating thick bone. The wash-tube goes nearly through the drainage-tube in order to free it of any accumulations.

Among the many advantages of this operation are: (1) the ready acquiescence of the patient; (2) the celerity and the slight degree of pain with which it is done; (3) the completion in one short séance of the diagnosis by lavage and the operation for therapeutic purposes; (4) the small wound, and the loss of only a few drops of blood; (5)

the ease with which patients are able to treat the cavity themselves; and (6) the fact that total anesthesia, and therefore assistants, are unnecessary.

The disadvantage is that the cure is delayed beyond that reported for some of the other antral operations; but when once healed these cases do not seem to have the reported tendency to recur. With larger tubes the cases have done better, and by employing the Friedländer dry method of treatment the outlook is most promising. The cases which have resisted treatment, and which have shown no progressive tendency to improvement under irrigation, have usually revealed some cause for the continuance of suppuration on exploring through the canine fossa. The ease with which remedies may be applied to the antrum by this method is in its favor. Iodoform is out of the question in one's private practice, and Chiari denies that it gives the positive results claimed for it by Krause, Siebenmann, and others. All operators, however, acknowledge the excellent results obtained by packing the cavity with iodoform gauze, and Chiari packs it even through the 4- to 6-Mm. opening in the alveolus, which he recommends.

In closing, a few words of caution suggest themselves. Do not attempt to aspirate the cavity. The blood-vessels are but poorly supported, and, the normal openings being closed, the cavity may be cupped. Do not syringe with strong solutions of peroxide of hydrogen, as advised in many books. Even after the cavity has been irrigated, some pus remains, and the pressure from the liberated oxygen, except with very weak solution, causes intense pain.

Do not make an exploratory puncture through the alveolus where dental caries exists, or you may readily infect a healthy antrum.

Owen (*Omaha Clinic*, vol. viii, No. 4) reports a number of cases of empyema of the maxillary sinus, and formulates the following rules for treatment:

In acute cases of mild type, all that is necessary, besides the removal of the cause, is the employment of the ordinary means for managing a severe coryza.

In acute cases of a severe type, dependent upon intra-nasal disease, besides the ordinary means as suggested, efforts should be made to irrigate the sinus through the normal orifice. Failing in this, the symptoms being urgent, and ordinary means having been exhausted, an opening should be made through the wall in the inferior meatus for drainage and irrigation. In the latter instance, if from some configuration of the part it is not possible to penetrate the antrum, a small opening for drainage and irrigation should be made between the roots of the second bicuspid and first molar if the first and second molars are sound, but if one is diseased and useless it should be drawn and the puncture made through the empty socket.

In all cases, acute or chronic, dependent upon diseased teeth, the teeth should be drawn and the antrum punctured through an empty alveolus.

In chronic cases, when the cause is in the nasal cavity, if polypoid degeneration of the mucous membrane, caries or necrosis of the wall be not apparent, the cause should first be removed, then irrigation through the natural opening should be given a fair trial. Failing to irrigate through the natural opening, or to cure by this means after a reasonable trial, a counter-puncture should be made in the inferior meatus for drainage and irrigation. A cure not having been reached in a few weeks by this method, a large opening should be made in the canine fossa for curettage and irrigation.

In long-standing aggravated cases, where degeneration of the mucous membrane, caries or necrosis, etc., is reasonably certain, besides the removal of the cause, a large opening should be made in the canine fossa for curettage, drainage, and irrigation, and a counter-opening made into the inferior meatus.

Frequent irrigations with a warm solution of boric acid should be the rule, and such other topical applications should be employed as the case may demand.

DIAGNOSIS AND TREATMENT OF FRACTURES OF THE UPPER THIRD OF THE FEMUR, INCLUDING THE NECK.

This subject, which is the first on the list selected for discussion by the Council of the Surgical Section of the British Medical Association (*British Medical Journal*, Oct. 12, 1895), is of especial practical interest, since there are few injuries in which accuracy of diagnosis is more important or more imperatively called for. It must be remembered that in such injuries many of the signs and symptoms of fracture may be present without the occurrence of such lesion, and, on the other hand, fractures may exist without many of these signs or symptoms.

STOKES, in opening the discussion, quoted Curling to the effect that in the majority of fractures in the capsule, the periosteum being torn, the circulation is diminished to a greater extent than in other descriptions of fracture, where one division of the bone is deprived of its nourishment from the medullary arteries. The loss, moreover, is not limited to its central structure, but the whole of the detached bone sometimes suffers, and the atrophy, instead of being merely eccentric, occurs throughout its texture—not only the cancelli enlarging, but the size of the head becoming insufficient to fill the acetabulum.

A similar process may result from impaired nutrition consequent on synovio-periosteal inflammation without fracture. Certain it is that atrophy of the cervix occurs after injury without fracture, thus proving not only a source of error in diagnosis, but also the cause of blame being unjustly attached to the surgeon for not recognizing the occurrence of a supposed fracture, the disappearance or diminution of the neck producing many of the apparent signs of this injury. The atrophy is essentially eccentric, the head of the femur sinks down upon its shaft, but "more commonly the texture remaining is brittle, and the bone gives way on receipt of even a trivial force."

This process of rapid absorption is, in the case of fracture, probably due, in the first place, to senile osteoporosis; and in the second place to the twofold action of the absorbents on the one hand, and friction of the broken fragments on the other; and in the case of contusion, to impaired nutrition consequent on a low form of synovio-periosteal inflammation.

The researches of Humphry and Charpy have apparently disposed of the commonly accepted belief that alteration in the angle between the axis of the cervix and the shaft is a frequently observed senile change, this being held to be one of the determining causes of fractures of the cervix in advanced periods of life. The author calls attention to the fact that inversion is sometimes noted in fractures of the neck. This, he believes, is due to the neck having been adducted and inverted at the time of the accident, and afterwards remaining in this position. Differentiation may, as a rule, be correctly made by bearing in mind that whereas in fracture we have usually a history of a direct fall on the trochanter, followed by eversion, shortening, and backward direction of the outer surface of the trochanter, occurring in advanced life, and with marked pain along the line of fracture, diminished tension of extensor muscles, occasional inversion, and that not well marked; in luxation, on the other hand, we have a history of forced rotation inwards, rarity of occurrence in advanced life, usual inversion, great shortening, approximation of trochanter to anterior superior spine, head of bone on dorsum ilii, movements difficult and restrained, absence of pain on trochanter, increased tension of extensor muscles, and constant, well marked inversion. In fractures of the brim of the acetabulum we have the head drawn upwards and backwards, with detached fragment of brim, shortening, inversion, crepitus, adduction, recurrence of shortening after extension is removed, and retained power of eversion and abduction of the limb. In fractures of the fundus we have usually comminution, head passing into the pelvis, shortening, liability to abscess-formations, and generally a fatal result. In contusions we have the normal relations between the anterior superior spine and trochanter preserved at first, but often ultimately lost, and the knowledge that pre-existing chronic rheumatism may in these cases accentuate the difficulty of differentiation in no small degree.

As to treatment, the author commends Senn's method, which consists in the application of a plaster cast with a screw arrangement by which a pad over the trochanter major keeps the fragments of bone in apposition. He has, however, had no experience with this method. Or, in place of this, he advises extension and lateral splints. Whatever appliance is used, provision should be made to enable the patient to sit up occasionally. Especially is this important in regard to aged patients. Extension should be not greater than will promote immobility.

The following conclusions are appended to the paper:

The alleged senile alteration in the angle between the axis of the cervix and the shaft of the femur does not occur, and cannot therefore be regarded, as it has hitherto been, as a predisposing cause of fracture of the cervix femoris.

The process of absorption in the case of fracture is probably due primarily to senile osteoporosis, and secondarily to the twofold action of the absorbents on the one hand and friction of the broken fragments on the other, and, in the case of contusion, to impaired nutrition consequent on a low form of synovio-periosteal inflammation.

In classifying fractures of the cervix or its base, a distinction should be made between those with and without penetration, and those with and without impaction.

Osseous union may take place in four out of the five different forms of fracture of the cervix femoris.

The further the fracture is from the base of the neck, the less is the probability of osseous union.

Fracture of the cervix may occur previous to epiphysial junction.

The differentiation of these injuries lies between fracture of the cervix or its base, luxation, fracture of acetabulum brim, of acetabular fundus, and contusion.

The principles of treatment should be fixation, rest, and moderate extension.

ACCESSIBLE SURGICAL TUBERCULOSIS.

McDILL (*Chicago Medical Recorder*, October, 1895) contributes a valuable and exhaustive paper representing a study of the more recent literature of this subject. He states that the general treatment has remained unchanged in the last three years, the main remedy being Schuller's guaiacol treatment. Local treatment by parenchymatous and intra-articular injections, especially by the sterile iodoform ten-per-cent. emulsion in glycerin, has, in combination with conservative orthopedic and operative treatment, become firmly established as the modern treatment of surgical tuberculosis. The technique of injection is as follows:

Penetrate joints where most accessible, sliding the skin before puncturing to procure a valve-like arrangement to the tubular wound, and avoid traversing thinned skin with the cannula.

When tuberculous pus is present, always wash out through the cannula with five-per-cent. carbolic acid or saturated solution of boric acid before injecting.

Injections should be made at intervals of ten to twenty days. If manifest improvement does not occur after the third injection, the treatment is probably useless.

When diseased bone can be felt in connection with a tuberculous joint, bore into it in different places and make parenchymatous injections.

Absolute asepsis must be secured by five-minute scrubbing of the surface and the hands with absolute alcohol; boiled instruments to be taken from the water by the surgeon himself. Iodoform ten-per-cent. emulsion to be sterilized in the bottle in which it is mixed, by a one-hour's exposure to dry heat of about 300° F.

Senn's syringe is probably the best, or a large Pravaz syringe, which should be used for no other purpose.

General anesthesia is rarely necessary. Schleich's method suffices in almost every case where painless operation is desired. [See page 195.]

The amount of iodoform to be used varies with the lesion, but should, as a rule, never exceed six drachms of the ten-per-cent. emulsion.

Patients can usually be allowed to walk about at once; but if temperature rises in the first twenty-four hours they should remain quiet till it subsides.

Injections are quite useless when mixed infection has occurred. Iodoform intoxication almost never occurs. Danger from erosion of an artery in connection with the abscess has been observed, but is rare, and no other dangers are to be feared except accidental infection, which is from faulty asepsis.

The action of iodoform is most promising in the treatment of heretofore most hopeless cases. In the treatment of tubercular spondylitis and abscess the statistics show that nearly sixty per cent. are amenable to treatment, both abscess and primary inaccessible bone lesion being cured.

When operable tubercular affections are encountered, incise, and curette or excise tuberculous tissue and sequestra. Flood the wound with ten-per-cent. iodoform emulsion, and close tightly without drainage, as advocated by G. Neuber, of Kiel.

Injection is a most valuable preliminary treatment for subsequent operative measures. Watson Cheyne alone of recent writers "looks upon injections of iodoform as of doubtful value, but is inclined to think that upon the whole the cases in which it has been employed have done better than the others."

Bier's method of artificial venous engorgement by means of moderate elastic constriction has given excellent results, especially in unopened joint-tuberculosis and where the constriction was continuous. Some excellent cures have been made in cases of testicle and shoulder tuberculosis by interrupted congestion.

Koenig discusses 620 cases of knee tuberculosis, of which sixty-five per cent. died. He holds that a well healed leg after resection is, all things considered, the most useful in the end.

Extreme shortening and marked flexion may develop after simple arthrectomies. It is further of interest that Hueter's five-per-cent. carbolic-acid injections have given better results than the iodoform. In making iodoform injections into the knee-joint the leg is extended, the patella pressed upon, the trocar plunged in on a level with the upper border of the patella on the outer aspect of the joint, halting the point just below the patella. The contents of the cavity are evacuated, the joint is irrigated with five-per-cent. carbolic-acid solution, and iodoform is then driven in. Repeat every two weeks. Four to six injections are usually sufficient. Atrophy of leg and thigh from involuntary inactivity, and a tropho-neurotic condition, will usually persist.

Anchylosis following treatment should never be forcibly broken up. Iodoformized bone chips should be used in all cavities. Guaiacol should be continued three months to a year after operation, and ambulatory treatment should be instituted as soon as possible after any operation.

In injecting the hip with iodoform, Van Bunger makes two landmarks: first, the femoral artery as it passes over the body of the pubes; and second, the centre of the upper border of the great trochanter. A line is drawn from one point to the other, and where it crosses the inner border of the sartorius the trocar, if plunged directly backward, will reach the joint and femur-neck. The bony neck should be penetrated deeply for parenchymatous injection; then the needle should be withdrawn slightly and the capsule filled.

In Pott's disease, sixty per cent. yield to iodoform injections, which cure both abscess and primary osseous foci.

In tuberculosis of the anal region, marked anemia and proctitis are positive contra-indications to operation, as they are usually indicative of some severe and grave form of internal and inaccessible tuberculosis, usually of the intestinal mucous membrane. Operation by the Paquelin cautery is by far the best method, as it renders the wound both sterile and bloodless, whereby exploration of multiple fistulæ is possible.

PERITONEAL IRRIGATION AND DRAINAGE.

CORDIER (*American Journal of Obstetrics*, October, 1895), in a paper with the above title, reaches the following conclusions:

Drainage is a life-saving process when used properly.

To use it is not an admission on the part of the surgeon that his work during the operation was imperfect.

The use of the tube alone does not produce or leave any condition that favors the development of hernia.

The omentum or other structures do not become entangled in the openings of the tube.

A small-sized flint-glass tube with small openings and open end should always be selected for pelvic drainage.

The tube does not produce fecal fistulæ.

The tube shuold be used when in doubt as to the absence or presence of drainage indications.

To depend upon the microscope findings as to whether a given case should or should not be drained is seemingly scientific, but is neither necessary nor practicable.

Gauze drains rarely should be used, and always should be supplemented by a glass drain.

There is no danger of infecting the patient through the tube, if the attendant is properly instructed.

Where irrigation is indicated, drainage should be used. Many cases will require drainage where irrigation was not indicated.

The emptying of the tube and the time of its removal must be governed by the indications and progress of individual cases.

Irrigation with a normal saline solution cleanses more quickly and effectively than the most thorough sponging.

The irrigating fluid should not be too hot to be comfortably borne by the operator's hands.

THREE SUCCESSFUL CASES OF SPLENECTOMY.

BLAND SUTTON (London *Lancet*, No. 3764, 1895) reports three successful splenectomies. The first patient was a girl, age seventeen. The tumor had been present since the age of five. For two years it caused dragging sensations and was accompanied by jaundice. Leucocythemia was excluded by blood-examination. The spleen was exposed by an incision through the left semilunaris. The viscus extended from the diaphragm to the true pelvis, its extremity being in contact with the uterus. The slender parts of the gastro-splenic omentum were secured with plaited silk, the suspensory ligament was ligated, and the spleen cut. The gall-bladder was found to be larger and thicker than usual; the stomach was large and reached below the level of the umbilicus. The wound was

secured in triple layers, and the patient returned to bed. She left the hospital sixteen days after operation, entirely well. The spleen deprived of blood weighed 2½ lbs., and on microscopical examination was found to be fairly normal in structure.

The second case suffered from anemia—a girl of five years. The viscus, which weighed ten ounces, was removed. The patient recovered at once.

The third case was one of wandering spleen occurring in a woman of thirty-two. On opening the belly the spleen was found in the hollow of the sacrum; the pedicle around it was very thick and hard. It was transfixed and secured with four plaited silk ligatures. The detachment of the spleen was followed by an abundant flow of blood, and two forcible but narrow jets of arterial blood issued from the cut surface of the pedicle. The stump was retransfixed with three silk ligatures on the distal (spleen) side of the first row of sutures, and, as the open, everted mouths of two large arteries were visible on the face of the pedicle, these were ligated separately with silk. The patient rapidly convalesced.

SEVEN CASES OF AMPUTATION OF THE HIP-JOINT.

PAUL (*Liverpool Medico-Chirurgical Journal*, No. 29, 1895) reports seven cases of amputation of the hip-joint, with no mortality. In not one was the shock greater than after any other major operation. The author holds that hemorrhage is commonly the most important factor in the causation of shock following amputation, and the second factor is the combined effect of the extent and duration of the tissue-injury. These are often in proportion to the height of the amputation, but are not necessarily so. Since a hip-joint operation may be performed in about the same time as any major operation, and involves no more tissue, he concludes that the high mortality is due to the greater difficulty experienced in controlling hemorrhage. In his own cases he fixed Esmarch's tourniquet by a bandage passed over the shoulder and around the opposite hip. A large anterior flap was cut from without inwards, disarticulation was accomplished, and a shorter posterior flap was cut from within outwards. The femoral artery was always tied as soon as the anterior flap had been cut, from fear of accident. The tourniquet is applied over two strips of bandage placed in front and behind and carried around the innominate bone, being hitched above the crest of the ilium in front and the tuberosity of the ischium behind. Then the free ends of the bandages are carried back to the shoulder and hip, and tied sufficiently tight to prevent slipping when the limb is removed. This takes off some of the elastic strain from over the external iliac artery, so a roller bandage is pushed under the tourniquet at this spot to increase the pressure on the vessel.

In the first case amputation was performed because of discharging sinuses. The second was a girl of eleven, with chronic hip-joint disease; the liver extended to the umbilicus; the patient recovered and the lardaceous disease retrogressed. The third case was a girl aged twelve; amputation was performed for hip-joint disease, and she recovered. The fourth, a woman aged twenty, suffered from sarcoma of the knee; amputation was performed in the middle third of the thigh; six months later, re-amputation at the hip-joint for recurrence; the patient recovered from this operation, but later recurrence developed in the lungs. The fifth patient, a girl aged twelve, exhibited an old hip-joint disease, with exhaustion; with very little shock, she promptly recovered, but with sinuses. In the sixth case, a man aged forty, with sarcoma of the intermuscular fascia of the thigh, the size of a small cocoanut, an operation was performed in March, 1893; in January, 1895, the patient was still free from recurrence and well. The seventh patient exhibited extensive joint disease; he recovered promptly. The author in a note appends an eighth successful case.

PELVIC ABSCESS TREATED BY INCISION AND DRAINAGE.

WATKINS (*Maryland Medical Journal*, Oct. 5, 1895) reports a number of cases of pelvic abscess successfully treated by excision and drainage. The technique of the operation is as follows:

The patient is prepared as for vaginal hysterectomy. The abdomen should also be prepared on account of the possible necessity of a celiotomy. The patient is anesthetized and placed in the lithotomy position; the posterior vaginal wall is retracted by a Sims speculum, and the cervix drawn down with a double tenaculum forceps. The uterus is dilated, the uterine cavity explored, curetted, irrigated, and packed with gauze, if indicated. An incision about one inch long through the vaginal wall is made near the cervix, opposite

the most prominent point of the tumor. This will usually be posterior to the cervix, but may be lateral and possibly anterior. Any connective tissue between the vaginal wall and the abscess is separated with the finger, or it may be necessary to divide some of the fascia with blunt-pointed scissors. Careful explŏration is now made to determine whether the peritoneal cavity has been opened; if so, it should be carefully walled off with gauze packing. The finger may now be passed directly into the abscess, or if the wall is tough it may be opened by a blunt instrument, such as a grooved director or sound, and the opening enlarged with the finger or forceps All of the pus is removed by thorough irrigation with sterilized water. Careful bimanual examination to determine the condition of the pelvic contents is now made with one or two fingers of the left hand in the abscess sac and the right hand over the abdomen. If additional abscesses are found, they may be punctured through the abscess-wall, may be opened by another vaginal section, or may be removed through an abdominal incision. The mode of procedure must be determined by the indications in each case.

Two drainage-tubes sutured together, one large and one small, are now inserted into the abscess cavity. The large tube is perforated for a distance of one or two inches; the end split, inverted, and sewed, so as to form a shoulder on each side which retains it in place after the abscess-wall has contracted about it. The drainage-tubes are fastened to the cervix by a suture for retention until the abscess and vaginal walls contract about them.

The after-treatment consists principally in the use of peroxide of hydrogen, frequent irrigation, and antiseptic douches. Any gauze left between the vaginal and abscess walls should be removed in from twenty-four to forty-eight hours after the operation. The drainage-tubes should be left in place as long as the discharge continues; this may be from three weeks to six months. When the rubber tubing becomes offensive it should be changed.

This operation should be performed:

When the condition of the patient is such as to make abdominal section extremely dangerous;

When the abscess is large, of long standing, and situated low in the pelvis, and when the patient gives a history of peritonitis;

When abdominal section reveals extensive and firm intestinal adhesions;

When the abscess is on the floor of the pelvis and is complicated by rectal fistulæ.

Vaginal section may be indicated for the separation of adhesions which fix the ovaries and tubes on the floor of the pelvis, and for examination of the ovaries and tubes.

Puerperal abscesses frequently do not involve the Fallopian tubes or the ovaries, and satisfactory results usually follow thorough drainage of them.

The writer has done vaginal section for pelvic abscess nineteen times, and in every case with relatively satisfactory results. In two cases operations for secondary abscesses were required; in one case abdominal section was necessary to complete the operation. Excepting in the two cases which developed additional or secondary abscesses, the temperature has become practically normal within a short time after the operation. There has been very little pain after the operation—usually none at all. The patients have almost invariably been out of bed at the end of two weeks. Aside from the accidents consequent upon anesthesia, the operation is devoid of danger.

Many of the operations are of too recent date to permit a satisfactory report of the ultimate success. Some, however, date back three years. None of the patients have suffered particularly from pelvic disease since the operation. Three of the patients have some enlargement to the left of the uterus which may later on require abdominal section, and two of them have a sinus.

The advantages of the operation are that it is not dangerous to life; is followed by little or no suffering; recovery is rapid; no raw surfaces are left in the abdominal cavity to cause adhesions.

The operation, however, is applicable in only a small proportion of pelvic abscesses. Furthermore, the diseased tissue is not removed; still the tissues may become normal after the abscess is opened and drained, as has frequently been the case after spontaneous rupture or puncture of the abscess. The favorable results which have followed simple incision and drainage of abscesses in other parts of the body may indicate that some cases of pelvic abscess have been treated by too radical measures. The nature of the abscess may be a guide in the selection of the method of treatment. For example, tubercular or gonorrheal abscesses more clearly indicate excision than do abscesses due to some other infection.

This operation should take the place of vaginal puncture or aspiration, which has been the usual vaginal operation for pelvic

abscess. In the latter operation the bladder, rectum, or some other portion of the intestinal tract, and large blood-vessels, have been punctured; two deaths are reported from injury to large blood-vessels. These accidents are avoidable in the operation above described.

Many authors advise, in cases where doubt exists as to the choice between abdominal section and vaginal puncture, that celiotomy be first performed, and then, if indicated, that puncture through the vagina be made. In such a case Watkins advises vaginal section, which could be immediately followed by abdominal section if necessary, in which case the previous vaginal section would not compromise the chances of recovery, but, on the contrary, would afford a perfect avenue for drainage and remove the pus which otherwise would be liable to escape into the abdominal cavity.

For suspected disease low in the pelvis, vaginal section permits of thorough and satisfactory exploration without subjecting the patient to the dangers consequent upon abdominal section.

TREATMENT OF LARYNGEAL TUBERCULOSIS.

GLEITSMANN (*New York Medical Journal*, Oct. 15, 1895) states that curettement is the most modern treatment of laryngeal tuberculosis. The indications for this operation are summarized as follows:

In cases of primary tuberculous affections without pulmonary complication;

In cases of concomitant lung disease which is either in the incipient stage or has at least not progressed to softening and hectic conditions.

It is best adapted to circumscribed ulcerations and infiltrations of the larynx; to the dense, hard swelling of the arytenoid region, or ventricular band, or posterior wall; to tuberculous tumors, and to affections of the epiglottis.

In advanced lung disease with distressing dysphagia resulting from infiltration of the arytenoids, curettement is justifiable as the quickest means of giving relief.

The contra-indications are:

Advanced pulmonary disease and hectic;

Disseminated tuberculous disease of the larynx, leaving little or no area of healthy tissue;

Extensive infiltrations producing severe stenosis, in which case tracheotomy is indicated.

Surgical treatment should not be recommended to nervous, distrustful patients, who lack the necessary perseverance or confidence in their physician. On the other hand, it is often surprising how willingly patients, knowing their precarious condition, submit to the operation; how cheerfully they permit the necessary manipulation when the physician, guided by the purest motives, devotes his best energies to their relief.

As to the operation itself, incisions into the infiltrated tissues, as recommended by Moritz Schmidt, have been followed by disappearance of swelling and ulcerations, as demonstrated by this operator. But the incisions often heal before resorption has taken place, and the observation that tuberculous lesions cicatrize spontaneously, as well as after surgical procedures, led to the adoption of curettement. Heryng's single curettes are best suited for cleansing and scraping of ulcerations; Krause's double curettes and Heryng's rotary curettes for excision of tuberculous infiltrations. The writer has experienced no difficulty in excising the arytenoid region or the ventricular bands, but found it a harder task to attack the posterior laryngeal wall and the epiglottis. Subglottic lesions can be operated upon with Schweinmann's forceps, and with laterally bent forceps an attempt may be made to reach also Morgagni's ventricles. As a rule, the work should be done in a hospital, as the patients need rest and have better attendance there in case any accident — for instance, bleeding — should occur. The after-treatment has to be carried out carefully, and applications of lactic acid or pyoktanin in one- to two-per-cent. solutions have to be made daily till cicatrization is completed, which the author saw in some cases taking place in one week, in others after three or four weeks.

The results of curettement are often dependent upon factors we cannot control. Aside from the concomitant pulmonary disease and the local laryngeal condition, the constitution of the patient and the character of the infection has a great deal to do with the prognosis. Ulcerations which are well defined, and not too large in area, give a better prognosis than extended, shallow ulcerations. Dense infiltrations, which are generally localized, are more favorable than edematous conditions. The smaller the number of tubercle bacilli in the removed tissue, the better it is for the patient. Of course, an element of greatest importance is the skill of the operator, his endeavor to remove all

infected tissue, and the attention he bestows on the after-treatment.

Submucous injections of the diseased epiglottis, the aryepiglottic folds, the arytenoid region, etc., were first made by Krause and Heryng during the summer of 1886, and have been practiced more or less ever since.

Chappell speaks very highly of this method of treatment; he injects creosote in an oily vehicle.

Electrolysis is adapted for hard infiltration, especially in the ventricular bands, the excision of which is liable to give rise to hemorrhage. It has not many adherents, because of the difficulty of manipulation and the length of treatment necessary.

The galvano-cautery has still fewer followers, being superseded by the curettement.

Tracheotomy will always retain a prominent place in the surgical treatment of laryngeal tuberculosis, as it is the paramount duty of the physician, if he cannot cure, to give at least relief to the patient entrusted to his care.

SOME POINTS IN THE PRACTICE OF LITHOTRITY OR LITHOLAPAXY.

MR. HARRISON refers to several important points in connection with the treatment of stone, which he believes are not dealt with sufficiently in text-books. As regards sounding for stone, he has never seen harm arise therefrom in children, in women, or in men not beyond middle age; on the other hand, in elderly men with enlarged prostate, etc., it may lead to very serious consequences. In such cases he thinks it advisable to defer the sounding until it can be employed "with all the precautions and resources that a comfortable bed, an anesthetic, antiseptics and proper attention afford." Should a stone be discovered, he thinks it advisable to have everything ready to proceed at once to its removal.

The lithotrites should be of the finest make and material, and their breaking power should be carefully tested previous to using them. Mr. Harrison insists on the importance of having a fenestrated instrument, which crushes and disintegrates the organic as well as the inorganic constituents of the stone and facilitates the evacuation. He describes and gives a sketch of an instrument improved by having a short lever instead of a sliding button to convert the slide movement into a screw after the fragment has been caught, and also a corkscrew handle instead of the usual wheel handle.

As a rule, the lithotrite should not be withdrawn so long as any fragments can be readily seized and crushed, thus limiting as far as possible the number of introductions of the instrument. In regard to the evacuating catheters, he prefers curved instruments, but likes to have a straight one for some cases—*e. g.*, those with enlarged prostate. He uses a long copper probe, with a stop at the handle, to clear the catheter of any fragment impacted in the eye or in the tube itself. He has the catheters made with eyes larger than usual, their rim smoothly beveled.

When the urine is very offensive, and bacteria are present in large numbers, the author adopts Guyon's practice of washing out with a solution of silver nitrate (1 to 1000). This requires a glass or plated syringe.

For anesthesia Mr. Harrison prefers ether, preceded by nitrous oxide gas.

Before introducing the lithotrite, he passes an evacuator catheter, and washes out the bladder with warm boric lotion, leaving in about two or three ounces.

To make sure the mucous membrane of the bladder is not gripped by the lithotrite, Mr. Harrison mentions that a slight rotatory motion of the instrument can be readily performed if the stone only is grasped, but not if the bladder-wall has been seized.

Sometimes it is extremely difficult to make sure that every fragment of stone has been evacuated, and the author suggests several stratagems to help in this matter, such as alteration of the position of the patient's body, free irrigation of the bladder in the ordinary and reversed positions, concussion of the pelvis with the hand, and its elevation.

When ordinary lithotrity is not possible or advisable—as, for example, when the patient's condition will not warrant a prolonged operation, in cases of stricture of the urethra, and in some cases of enlarged prostate—Mr. Harrison performs the operation of perineal lithotrity. "The bladder is reached by puncturing the membranous urethra on a grooved staff in front of the prostate, so as to admit the index finger as for digital exploration of these parts. This being done, a pair of either straight or slightly curved crushing forceps —the circumference of which does not exceed an average index finger in measurement —is then passed into the bladder, and the stone is seized and broken into fragments." The operation is completed by washing out the fragments and inserting a drainage-tube, which is retained for a few days.

The author figures his crushing forceps,

which have a cutting rib on the blade, and a screw at the handle to aid the crushing.

Perineal lithotrity has the great advantage, in foul, unhealthy conditions of the bladder, of affording free drainage. It is also performed in very much less time than ordinary lithotrity, and is not nearly so serious an operation as supra-pubic cystotomy, although as large stones can be dealt with by perineal lithotrity as by the supra-pubic operation.—*Medical Chronicle*, October, 1895.

THE INFILTRATION METHOD OF ANESTHESIA (SCHLEICH'S).

The following are the solutions advised by Schleich (quoted by WURDEMANN in the *Journal of the American Medical Association*, Nov. 16, 1895) in the performance of his cutaneous infiltration:

Solution No. 1, Strong—for operation upon highly inflamed or hyperesthetic areas:

℞ Cocain. mur., gr. j;
Morph. mur., gr. ⅙;
Natr. chlor., gr. j;
Aq. dest., ad f℥ j.
M. Sterilisat. adde sol. ac. carbol. 5-per-cent., gtt. ij.

Solution No. 2, Medium—for most operations:

℞ Cocain. mur., gr. ss;
Morph. mur., gr. ⅙;
Natr. chlor., gr. j;
Aq. dest., ad f℥ j.
M. Sterilisat. adde sol. ac. carbol. 5-per-cent., gtt. ij.

Solution No. 3, Weak—for superficial operations upon nearly normal tissues:

℞ Cocain. mur., gr. 1-20;
Morph. mur., gr. 1-40;
Natr. chlor., gr. j;
Aq. dest., ad f℥ j.
M. Sterilisat. adde sol. ac. carbol. 5-per-cent., gtt. ij.

The keeping qualities of these solutions are improved by the addition of three drops of trikresol to each prescription. Tablets, triturates and compressed tablets are made of these solutions by Parke, Davis & Co. of such strength that one should be dissolved in three ounces of boiled water.

The technique of the operation is as follows: The field of operation is made aseptic in the usual manner. Having the required formula, the solution aseptic and cold, we fill the sterilized hypodermic syringe; pinching the skin slightly between the thumb and forefinger of the left hand, the needle is then passed obliquely under the epidermis to the papillæ, intra-cutaneously, until the lumen is fully inserted. A few drops are then injected, thereby producing a white elevated wheal, the infiltration extending throughout the whole thickness of the skin. There is immediate and complete anesthesia throughout the extent of the infiltration, which lasts from ten to twenty minutes according to the density of the tissue so edematized. The needle is then reinserted, at the periphery of the wheal, and the area infiltrated to the required extent and depth. No tissue offers any deviation from the dictum: Every structure is made anesthetic that can be artificially edematized; this holds good for skin, mucous and synovial membrane, periosteum, fascia, muscle, lymph-glands, nerves, viscera, and even bone.

Anesthesia exists only within the area infiltrated by the solution; outside of that, normal sensation remains. In operations requiring extensive division of the skin and mucous membranes the first wheal is increased to the size of a dime by increased pressure on the piston, and the needle is then removed and reinserted at the periphery of the wheal, but still within it, and a new wheal raised. In this way the line of incision is marked out to any desired length or breadth. In general surgical operations we would then infiltrate the underlying tissues, by slowly pushing in the needle and injecting a few drops at a time until the deeper tissue is edematized.

By cooling the spot selected for the formation of the first wheal by ether or rhigolene spray, or on mucous membranes by touching the spot with a strong solution of carbolic acid or applying cocaine, the first injection may be made, if so desired, without even feeling the prick of the needle. This is seldom necessary, as a very fine needle may be inserted without pain even in very tender tissues, such as the eyelids. The succeeding injections may now be made without causing sensation. There is no sensation to the infiltration proper.

Where the tissues are inflamed, the sensibility is pathologically increased. Here it is indispensable that the infiltration be begun in sound tissue and carried over into the part to be operated upon. The dilated blood- and lymph-channels of the inflamed skin allow us to anesthetize quite a large spot from one puncture.

The injection should be done slowly at first, and when the infiltration is only felt by its tension we may rapidly flood the part to the required extent. Under no circumstances must fluid be primarily injected into an abscess, an exudation, or a pathological focus;

the only result is increased tension and pain. We must not lose sight of the cardinal fact that the anesthesia exists only within the area infiltrated by these solutions. The method rests principally on the production of a complete artificial edema of the tissues. Wherever we wish to operate with exact anesthesia, the field of operation must be tensely filled with the solution so that it exudes from the cut surface.

It should be remembered that our use of attenuated solutions of the narcotic drugs has nothing akin to the doctrine of the followers of the dogma "Similia similibus," etc. These statements may be readily substantiated by self-experimentation. Cocaine injections of solutions of the usual strengths (five to ten per cent.) are certainly far more dangerous to life than the administration of chloroform. The higher solutions of cocaine surely diminish the exudative process and retard the healing, and in some cases actually destroy the trophic filaments so that gangrene has been known to occur. Nothing of the sort has been found to result from the infiltration of the solutions recommended in this article. Anesthesia is complete and occurs immediately, and lasts long enough for almost any external operation. There is no objection at any time to repeating the injection if feeling should return during the operation. Indeed, we might safely operate for hours upon a small area if so inclined. The advantages of the method are also evident from its simplicity, safeness, and celerity.

The method has gained credence and is now in common use by many busy practitioners. Operations have been done, from the removal of ovarian tumors, and amputations, down to the opening of boils, without pain, and with satisfaction both to the physician and patient. The writer has personally operated upon the eyelids of half a hundred patients, as well as upon other parts of the body, under this form of anesthesia, while prosecuting the investigation. His first operation was upon a deep-seated felon. He has assisted at a number of circumcisions, excisions of tumors, and minor operations, making the injections himself. He has had reports from many surgeons in different portions of the United States, of the employment of this method for operations varying in severity from ingrowing toe-nail to hernia, in which the anesthesia has been satisfactory; healing has been by first intention, and in only three instances has he had reports in which it has been delayed.

RADICAL CURE OF HERNIA.

MOORE (*Australian Medical Journal*, vol. xvii, No. 6) thus quotes from the *Archiv für Chirurgie* Bassini's description of his operation:

In the oblique acquired inguinal hernia the patient is deeply anesthetized and then made thoroughly aseptic. The surgeon incises the skin of the affected inguino-scrotal region, lays bare the aponeurosis of the external oblique to an extent which corresponds to the inguinal canal (dissection of the hernia), exposes at the same time the pillars of the external abdominal ring; arrests the hemorrhage. This is the first stage of the operation.

In the second stage he divides the aponeurosis of the external oblique muscle from the external to the region of the internal abdominal opening, then separates upwards and downwards in the form of two flaps the external oblique aponeurosis, isolates and raises *in toto* the cord and the neck of the sac. Whilst holding the index finger under the structures mentioned he separates the neck of the sac up to the mouth of the hernia from the structures forming the cord. The separation is effected without great difficulty by means of blunt instruments, whether the case be one of acquired or congenital hernia. The separation of the neck of the sac must be carried into the iliac fossa—that is, above the mouth of the sac itself. He then at once separates the body and fundus of the sac and bends it outwards, opens the fundus and examines whether its contents present adhesions or not, and whether the omentum is thickened. If there are adhesions he separates them, and removes the omentum so far as is necessary. After pushing back the intestines he turns the sac (its neck), places a ligature on the further (abdominal) side of the mouth, and cuts away half a centimeter below the ligature. When the hernia is very large and the neck and mouth of the sac very broad, in addition to the simple ligature he applies below—that is, to the outer side of this—by transfixion, another ligature in two parts, in order to ensure the closure of the sac and to prevent the slipping of the ligature. The peritoneum, ligated in this way, draws itself back into the iliac fossa. With the extirpation of the sac, and the placing of the ligature on the further side of its mouth, ends the second stage of the operation.

In the third stage he turns away the isolated cord and draws it lightly upwards on to the abdominal wall. He does the same, if

necessary, with the testicle, which is drawn up out of the scrotum. With broad retractors he has the lower flap of the external oblique aponeurosis drawn downwards, the upper flap upwards, and in this way it is easy to expose the groove made by Poupart's ligament up to its posterior border, and a centimeter above the place where the cord passes out of the iliac fossa. Next he separates the outer border of the rectus abdominis muscle and the threefold layer which is formed by the internal oblique and transversalis muscles and the vertical fascia of Cooper from the aponeurosis of the external oblique and from the subserous adipose tissue, until the threefold layer can without difficulty be drawn near to the isolated posterior border of Poupart's ligament. After that is done he sutures with interrupted sutures these two parts together, a distance of five to seven centimeters from the pubic crest outwards to the cord, which is displaced outwards about a centimeter from the anterior superior spine of the ilium. Herewith is the third stage of the operation completed, and the inner or abdominal opening and the posterior wall of the inguinal canal are restored.

In the above mentioned suturing, it is advisable to use silk and (separate) interrupted sutures, and to embrace two or three centimeters from the edge of the threefold musculo-aponeurotic layer. The two first sutures placed close to the pubis embrace also the outer border of the rectus abdominis muscle. When this stage of the operation is at an end, then one can see, if the patient is excited to vomit (Bassini tried this in his first fifty cases) that the inguinal region is in a position to resist the strongest intra-abdominal pressure, and that the threefold musculo-aponeurotic layer, fixed to Poupart's ligament, is tightly stretched and becomes hard and unyielding in its new position.

In the fourth stage of the operation, he places the cord back in its place, and the testicles also; unites with sutures the aponeurosis of the external oblique until the edges of the pillars of the ring are brought close to the cord; then unites the skin; and finally the dressings are applied. He uses drainage in none but very voluminous old hernias, where the dissection and isolation of the sac have been very difficult. In this way the inguinal canal is again restored, with an internal opening and a posterior wall, both formed by the threefold musculo-aponeurotic layer fixed to the posterior edge of the groove formed by Poupart's ligament, and with an anterior wall and a narrow external or subcutaneous opening formed by the united flaps of the aponeurosis of the external oblique. In the external inguinal hernia, especially if it has a considerable circumference, the inguinal canal loses its oblique direction; it is straight or almost straight. By the operation described, it again acquires its natural direction. The cord pushed lightly outwards now penetrates the thickness of the abdominal wall obliquely, at the place where the canal has been newly made. The lines of deep sutures do not correspond to one another; the posterior are under, the anterior over the cord.

CANCER OF THE RECTUM.

POWERS (*Journal of the American Medical Association*, Nov. 9, 1895), after detailing several cases operated upon by himself, states that in the future he will proceed after the osteoplastic method of Rydygier.

Much depends on a proper selection of cases. A large proportion of patients with cancer of the rectum, when first seen by the surgeon, will be found in too advanced a condition to warrant thought of cure. The disease progresses slowly and often reaches an advanced stage before the increasing occlusion of the gut seriously attracts the patient's attention.

The earliest possible diagnosis on the part of the family physician is of the greatest importance. These cases first come under the care of the general practitioner, and his examination should be most thorough. In no affection about the rectum should digital examination be omitted. The examining finger is of far greater value than instruments, so far as the region which lies within its reach is concerned. In case of a suspicious though indefinite ulceration, dilatation of the sphincter with removal of a small piece of the tumor for microscopic examination will be found of the greatest service. So long as the patient's condition warrants, we are not justified in leaving any measures undone which may aid in establishing a positive diagnosis. Cancer is not so very infrequent in patients under thirty years.

It is difficult to obtain the exact mortality attending extirpation of the rectum; in general it may be estimated at about twenty per cent. Before the introduction of the Kraske method it was something like fifty per cent. It will doubtless fall materially as the selection of cases and the operator's technique further improve.

Curtis collected statistics of 420 cases from eleven clinics, and found that without separating the perineal from the sacral operation the mortality was 15.5 per cent. It is without doubt greater in the sacral than in the perineal, as in the former the disease requiring operation is further advanced and the procedure itself is much more severe.

As regards the chief point in any operation for malignant disease—immunity from relapse,—the author gives no figures. Curtis, in 144 cases which had run over four years, found 21.5 per cent. of four-year cures. These were, however, both sacral and perineal operations, and more of the latter than of the former. Whatever the percentage of radical cures may be, it is sufficient to encourage surgeons in their attempts. So far as we now know, the only hope of cure in cancer lies in its early recognition and prompt and wide excision, and it is on these lines that progress must and will be made. Advance in the past ten years has been steady, and much ground has been gained. It is to be hoped that the future will give us a specific, be it in the line of serum or other therapy, against this most malign disease. At present, however, our trust must be placed in operative procedure, and in the accomplishment of lasting results the physician and the surgeon must cooperate.

RUPTURE OF THE PANCREAS.

LEITH (*Edinburgh Medical Journal*, November, 1895) has given careful study to the literature of rupture of the pancreas, and reports some cases. His first group includes those in which a fatal issue followed early upon injury; the symptoms were shock and collapse, and in no case did they point to the pancreas as the main seat of lesion. The absence of external lesions of the abdomen is important and not a little surprising. Diagnosis is impossible without laparotomy, although the nature and direction of the violence and the exact site of impact make a suspicion of the lesion possible. The anterior surface of the pancreas can be thoroughly explored by a vertical incision about three inches long, in the middle anterior line, or preferably a little to its left, in the epigastric region. If an electric lamp be placed in the interior of a Ferguson's speculum, both the organ and its covering peritoneum can be scrutinized.

Death is usually due to hemorrhage. The lesion is rarely the only one present; and since diagnosis is impossible, treatment must be expectant or must be founded upon an exploratory laparotomy. In case the latter operation has been performed, the hemorrhage may be arrested by pressure, and the ruptured ends brought close together by comparatively superficial sutures passing through little more than the peritoneal covering of the gland. The covering adheres so closely to the gland without the intervention of any fatty or other tissue that it is easy to bring the separated ends together by traction exerted alone upon the peritoneum. This procedure is, however, open to the objection that blood or pancreatic juice might collect between the ends and cause their separation again, and lead perhaps to cyst-formation or other trouble. Senn, from his experiments on animals, recommends that the ends of the ruptured gland be separately ligated previous to such suturing. This has the advantage of effectually arresting the hemorrhage and the outpouring of the pancreatic juice, and, further, the close approximation of the ends favors the rapid establishment of the nutrient vascular supply. He would first remove the necrosed portions of the gland. He found that ruptures treated in this way quickly healed, and that there was no danger to be apprehended from the distal part of the gland, as all such physiologically separated portions underwent simple atrophy and in no case led to cyst-formation.

The milder cases of pancreatic rupture may, and probably usually do, recover. Certainly autopsies prove that this result may occur. As a matter of clinical history it is well understood that after injury received in the epigastric region there may follow after a considerable interval of time a cyst in this region. Indeed, the large proportion of pancreatic cysts are held to be of traumatic origin, and a table of seventeen such is given. The earliest tumor appeared ten days after injury, the latest eight years. As to the method of forming these cysts, the following is Cathcart's explanation: "The injury causes a laceration of the gland. This is followed by extravasation of blood, and with this is mixed the pancreatic secretion from the torn ducts. Not only is a constantly increasing fluid thus added to the original hematoma, but the collection of fluid probably becomes irritating in character. It will thus tend to excite the formation of a capsule around it, and by chemical irritation and tension would gradually increase in size."

Wherever we have a collection of fluid about whose boundaries and connections we are somewhat in doubt, the natural tendency

is to evacuate the fluid with the least possible disturbance of parts. Hence we find that the first procedure adopted was an emptying of the cyst by means of aspiration. Experience has shown, however, that this is both ineffectual and dangerous. The cyst gradually refills, and attempts to secure its obliteration by means of the injection of iodine, etc., have been somewhat disastrous. A fatal peritonitis has resulted more than once; indeed, the simple aspiration itself has been followed by somewhat similar serious consequences, brought about doubtless by the rupture of the cyst-walls when thin, and the sudden escape of the contents into the peritoneal cavity.

Aspiration has thus been abandoned in favor of laparotomy, which is the favorite method of treatment at the present day. The cyst is brought forward to the anterior abdominal wall, incised, and emptied. Drainage is secured by means of a pancreatic fistula, which discharges for a variable time and then heals. This was the method employed in the seventeen recorded cases of traumatic cysts, in all of which except one it was successful. It has been followed with like success in many other cases. Krecke says that out of twenty-seven cases treated by section and drainage, all recovered; and out of six cases treated by dissecting out the cyst, three died.

The advisability of trying to dissect out the cyst is very doubtful. Excision may be easy in some cases, but will be difficult in most, and experience does not favor its recommendation.

The method of anterior incision and drainage, notwithstanding its success, is not altogether perfect. It has actually failed to cure in a few cases, and other objections may be urged against it. It is much more suitable for the somewhat movable cysts which come forward to the anterior abdominal wall. These are generally broader anteriorly than posteriorly, and are thus readily opened from the front. It is not nearly so suitable for that other division, which are somewhat sessile, broader posteriorly than anteriorly, and much less movable; these are not easily reached by an anterior incision, and, moreover, it is by no means easy to bring the wall of such a cyst forward to the anterior incision and thus to secure its safe evacuation. In addition we have to urge the obvious disadvantage of the anterior incision, alike for men and women, in so far as it interferes with the natural usefulness of the abdominal wall and provides for a drainage of the most imperfect character, allowing of a cure only after a more or less protracted period. Further, the possibility of the pancreatic fistula becoming permanent must not be entirely denied. Senn in his experiments found that it never occurred, but actual experience in the human subject does not quite bear this out. Gould, indeed, mentions a case in which not only did the pancreatic fistula remain permanent, but malignant disease appeared around it. It appears to be not only reasonable, but most advisable, that we seek for some method of reaching these cysts which shall be free from these objections.

Cathcart and Littlewood have spoken of the ease with which a counter-opening could be made posteriorly in these cases, and it occurred to the writer that they might be primarily reached and drained by posterior operation. He therefore verified this suggestion many times upon the cadaver. He found it much easier than he expected, to cut down upon the tail of the pancreas and lesser omental sac. A vertical incision, about three inches long, is made at the outer border of the left erector spinæ, beginning above the twelfth rib. After cutting through the skin and fascia, the thin fibres of the latissimus dorsi are first recognized, and then the strong fascia at the outer border of the erector. This is incised, and the upper border of the quadratus lumborum is next seen running downwards and outwards. The finger is inserted above it, and feels for the posterior surface of the kidney through the fat and cellular tissue. It then defines the position of the renal vessels. The tail of the pancreas and the posterio-lateral wall of the lesser omental sac lie just above and inside them, and by inserting a probe it is possible to enter the cavity of this sac at will, either through the mesocolon below the lower border of the pancreas, or through the posterior peritoneum above this gland, according to the upward obliquity given to the probe. In no case was the supra-renal capsule or any other structure in the neighborhood injured. When the lesser omental sac was distended with fluid, fluctuation could be distinctly felt by the exploring finger working upwards above the renal vessels, and fluid could be evacuated with ease by means of a drainage-tube, made to enter the sac with the help of a director and pair of dressing forceps. This procedure will be found to be quite as easy in cases of pancreatic cysts, and probably of others in this neighborhood. The cyst-wall may be in some cases thick, and thus a little difficult to penetrate, but that need not cause much trouble,

while the long-existent distention will have brought the cyst within more easy reach,—it may even extend downwards below the line of the renal vessels, and thus be reached by the surgeon whether he goes above or below these structures.

This method of reaching these cysts from behind was adopted by Mr. Cotterill with complete success in a case under his care. He entered the sac below the renal vessels. The patient is doing well. Others have adopted a posterior incision after an anterior one had failed. Thus, Gould mentioned that in a case where the cyst was fixed and could not be brought to the surface, with a finger in the cyst he cut down behind below the twelfth rib and drained it posteriorly. The fistula rapidly closed. A better proof could hardly be given of the advantages of the posterior incision. He would doubtless have easily reached the cyst had he tried the posterior incision at first. He would strongly advocate this method of procedure, not only because of its ease, but because of the advantages of a posterior over an anterior incision, and of the more perfect drainage and much more rapid convalescence and cure which it promises. Even if it were to fail to reach the cyst, it would in no way prejudice the success of an anterior exploration, and would, moreover, even in such a case allow the rapid establishment of posterior drainage.

THE TREATMENT OF SOFT CHANCRE.

The following treatment is recommended by *La Tribune Médicale*, No. 28, 1895: Every morning the ulceration should be touched with a tampon of cotton wet in this solution:

Menthol, gr. j;
Carbolic acid, gr. v;
Alcohol, f3 iss.

Aristol is next dusted on, and a piece of absorbent cotton applied, thus completing the dressing. The patient is directed to wash the sore several times with carbolic-acid solution and to dust with aristol. All friction or causes of congestion are to be avoided.

Phagedenic ulcer is touched with solution made up of:

Cocaine, gr. j;
Potassio-tartrate of iron, gr. xv;
Distilled water, f3 iss.

It is next powdered with a mixture of 20 parts iodoform aud 5 parts menthol; and potassio-tartrate of iron is given internally.

OPERATION FOR THE RADICAL CURE OF HYDROCELE BY EXCISION OF THE SAC.

Lockwood (London *Lancet*, Oct. 19, 1895) states that excision of the sac may be rendered an aseptic process, and seems to afford an excellent prospect of success. It is reasonable to suppose that the removal of about nine-tenths of the diseased secreting membrane, and the exposure of what is left to the loose cellular tissue of the scrotum, could hardly be followed by a reaccumulation of the hydrocele fluid. The results of the operation will go far to show that this assumption is correct. And here it is to be said that the title of this paper is not strictly applicable to the operation performed upon ordinary hydroceles of the tunica vaginalis. For the cure of these, only the parietal layer of the tunica vaginalis has been excised, but in encysted hydrocele the whole sac is cut away. He has excised the whole of the parietal layer of the tunica vaginalis twenty-four times for the cure of hydrocele, and once for hematocele. No attempt was made to select the cases. The youngest was sixteen years old, the oldest sixty-eight. Some could hardly be considered good subjects for an operation. One patient, a man aged forty-one, had been a heavy drinker; his face was covered with acne rosacea; he had a high-tension pulse and probably some aortic stenosis, and his urine contained a trace of albumin. He took ether well, and suffered no apparent harm from the operation. A man aged sixty-three, who had acne, admitted that he drank; another, who was a plumber, suffered from lead poisoning; several had chronic bronchitis—a very objectionable complication on account of the anesthetic, and one that can best be overcome by choosing the warm months of the year for the operation, and by skillful administration of the anesthetic. In several cases the hydrocele was accompanied by other affections. In one, a hydrocele on the right side and a varicocele on the left were operated upon at the same time. In another, both sides were operated upon at the same time, the hydrocele being double. In another case the presence of an acquired hernia upon the same side as the hydrocele made no difference. A man who had a hydrocele and organic strictures of the urethra was operated upon first for the cure of the hydrocele, and a week later for the cure of the strictures; the last operation was followed by orchitis. In one case the hydrocele was

bilocular; the testicle was surrounded by an ordinary hydrocele of the tunica vaginalis, and a second large sac (full of about half a pint of clear yellow fluid) lay above the head of the epididymis. Both sacs were treated in the usual manner, the upper one being entirely removed.

The operation was performed for various reasons—in some because of the size and weight of the hydrocele; in others for pain and discomfort, especially while riding horseback; in still others, to enable the patients to enter the army or other public services. One patient was by the operation enabled to wear a truss for hernia which was unsuitable for radical cure. Some of the patients had become weary of being tapped—one man had been tapped twenty-four times. One patient was alarmed because his hydrocele had been burst at football. This accident had not brought about a cure, as happened to a man the writer saw under Mr. Rutlin's care, and of whom it is stated that his hydrocele had been burst by the wheel of a wagon passing over it. Another reason might influence the decision as to the desirability of operation: the author has observed that in large hydroceles of long duration the testicle has become flattened out and wasted, and apparently useless; in some of the operative cases the gland was considerably altered, the epididymis having become separated from the body of the testis.

Before operating for the radical cure of hydrocele by excision of the sac, it is, as a rule, advisable to tap once to ascertain the condition of the testis. It would be disappointing to find a gumma, or a mass of tubercle, or even a malignant growth. Inasmuch as the fluid in a hydrocele is quite thin, like water, a very small trocar and cannula suffice for the tapping. A cannula two millimeters in diameter is quite large enough. The instrument usually figured in text-books is a relic of mediæval surgery. Strange to say, one of the cases upon whom the writer intended to operate underwent a spontaneous cure. A man aged sixty-five came in January, 1894, with a hydrocele of two years' duration, which had been tapped five times. He had bronchitis, so the hydrocele was tapped again and the patient told to come in June to be cured. He returned in June with no trace of hydrocele, and said that after the tapping the sac had rapidly refilled and then got quickly well. He has remained quite well of his hydrocele up to the date of this paper.

The operation of excision of the parietal layer of the tunica vaginalis is exceedingly simple. An incision is made the whole length of the long axis of the hydrocele. The sac is exposed and separated from the scrotum until the spermatic vessels are almost in view. It matters little if the testicle is entirely withdrawn from the scrotum. A puncture is made to let out the hydrocele fluid. This small opening is enlarged to admit the finger to ascertain the position of the testicle, epididymis, and vas deferens. Occasionally the vas is upon the front of the sac, having been displaced. The testis, too, is sometimes in front, as in one of the author's cases. As a rule this point will have been cleared up before the operation is begun; but when the sac is thick the shadow of the testis cannot be seen. The finger in the sac also makes out the exact limits of the epididymis and of the testicle; in big old hydroceles these organs are flattened out and sometimes pulled apart. In one of the author's cases the epididymis, separated from the testicle, lay almost in front of the sac.

These points having been cleared up, the whole of the parietal layer of the tunica vaginalis is cut away to within a quarter of an inch of the testicle and epididymis. Much misconception seems to exist as to the quantity of tunica vaginalis which is taken away. The writer is continually asked whether the visceral layer is dissected off the testis and epididymis. Sometimes in very big hydroceles the tunica vaginalis runs up the front of the spermatic cord. This prolongation must be thoroughly removed.

The arrest of hemorrhage is of the utmost importance in this as in other operations upon the scrotum. A hematoma easily forms in the scrotum and detracts considerably from the comfort of the patient and from the success of the operation. In one of the author's cases no vessel required ligature, but as a rule eight or twelve have to be secured with fine twisted silk. As a further provision against a hematoma, a large drainage-tube is laid along the depths of the wound and brought out at its upper angle. The rest of the skin incision is closed with fishing-gut sutures placed about a third of an inch apart. Trouble expended in obtaining accurate apposition of the wound is well repaid.

The skin of the scrotum heals with great rapidity, and the union becomes quite strong in a week. It may be observed that no caustic is applied to the visceral layer of the tunica vaginalis, which is, of course, left behind. Such applications are not required, and they

would increase the pain and also cause orchitis.

Twenty-four hydroceles were treated in this way. In addition a hematocele was met with, and received the same treatment. After all the blood and clot had been taken away, the whole of the parietal layer of the tunica vaginalis was excised. The after-treatment was the same as that of the hydrocele cases, and will be described presently. Repair was rapid, and the after-result left nothing to be desired.

The writer describes his aseptic precautions as follows: The evening before the operation the patient is thoroughly shaved and has a hot bath, with abundant soaping and scrubbing. The skin, having been thus cleansed as far as practicable, is further prepared by the extraction of its fatty matter with ether or turpentine. It is disinfected by being washed for two minutes with a 1:500 solution of biniodide of mercury in rectified or methylated spirit. This is washed away with biniodide-of-mercury solution (1:2000), and the skin is covered with carbolic gauze wet with the same lotion. It is advisable to add some glycerin to this lotion to help to keep the covering moist and assist the chemical to penetrate the skin. It is usual, also, to give a mild purge the night before the operation. These precautions are used for hospital patients; but for others less drastic measures usually suffice.

Very few instruments are required; a knife, a pair of scissors, a needle, and a few pairs of pressure forceps are all that is necessary. These, together with the drainage-tube, are sterilized by boiling for a quarter of an hour. Fine twisted silk (No. 0 size) is used to ligate bleeding vessels, and fishing-gut for closing the incision. These are also sterilized by boiling, and together with the instruments are afterwards kept in freshly made carbolic solution (1:40).

After the patient has been anesthetized, the field of operation is prepared by removing the protective dressing and thoroughly wrapping up the penis in carbolic gauze which has been soaked in biniodide-of-mercury lotion (1:2000). This "phallic shield" is of the greatest importance in this and other operations about the genital organs, especially in operations for varicocele and for the radical cure of hernia. The area of operation is surrounded with towels sterilized by boiling or steaming for half an hour, and kept wet with 1:40 carbolic lotion. One of these towels is passed across the thighs and under the hydrocele to support it. Before making the incision the skin receives a final swabbing with alcohol and biniodide, and is then sluiced with 1:2000 biniodide-of-mercury lotion, which is used throughout the operation. Sponges are prepared by the sulphurous-acid method.

The wound is dressed as follows: After a thorough dusting with iodoform crystals, the scrotum is covered with a layer of five-per-cent. carbolic gauze soaked in biniodide-of-mercury lotion (1:2000). This is covered with alembroth wool, and an outside dressing applied. The outside dressing is the usual eight-fold layer of carbolic gauze, with a covering of jaconet. It is accurately cut, and fitted with great care. It is triangular, with an aperture near the base for the penis to pass through. To the apex of the triangle two strong bands are fixed. When the dressing is in position these bands hold its apex against the perineum and are carried round the thighs to meet the pelvic band in front—this is a similar band of soft material which is fastened to the other angles of the dressing. The bands secure the dressing firmly in position by being carried round the pelvis. The straps are best made of stout bandage or of webbing. After they have been pulled tight a little extra alembroth wool may be stuffed beneath the dressing to exclude air and make some pressure upon the scrotum.

The after-treatment of these cases is simple and uniform. After the anesthesia has passed off, any light diet may be given, and the minor indulgences need not be stopped. The dressing is taken off at the end of forty-eight hours for the removal of the drainage-tube. This is done with the same precautions as those used for the operation. On the seventh or eighth day the dressing is finally removed and a suspensory bandage of linen applied. The patient now gets up to lie on a couch, and is able to begin work again within a fortnight.

The immediate results of excision of the parietal layer of the tunica vaginalis seem to leave little to be desired. The asepsis, which is so essential to safety, seems easy to secure. Only one of the cases had subacute suppuration, which was by no means severe. Owing to his physical conformation, urine escaped several times into the dressing. An endeavor was made to shut off the wound with iodoform, collodion, etc. Seven months after the operation he was quite cured, and, except for the scar, it would be impossible to find anything abnormal.

Examination of cases which have been

operated upon shows that the scar of the incision is hardly visible. The testicle slips about quite freely within the scrotum. The gland in most cases is larger than its fellow, but quite soft and painless. The author has observed this slight enlargement in cases which have been cured by iodine. It has probably nothing to do with the operation, but is related in some way to the hydrocele.

NOTES ON RETENTION OF URINE FROM URETHRAL STRICTURE.

GOULEY (*Journal of the American Medical Association*, Dec. 21, 1895) recalls attention to some of the ready and simple methods of relieving sufferers from the distress caused by retention of urine due to urethral stricture. This kind of urinary retention is seldom sudden; it is ordinarily preceded by difficult urination, whose increase—from month to month, from week to week, from day to day—is proportionate to the diminution of the urethral calibre at the diseased point, and also to the degree of muscular spasm of that part of the canal. For several weeks prior to complete retention, although urination be very frequent, the bladder is not emptied; this constitutes incomplete retention of urine which, from its stagnant state, soon gives rise to cystitis. At length the urine ceases to flow; there is then complete retention. This urine, accumulating for thirty-six or forty-eight hours, begins to slobber involuntarily, when the complete relapses into incomplete retention.

The laity often regard involuntary escape of urine as cause rather than effect, and endeavor to repress the "undue flow" by sundry processes which, fortunately, prove ineffectual. Meanwhile the vesical distention increases, and, unless the patient invokes a physician's assistance without further delay, the urethra is likely to burst behind the stricture and give issue to the urine, which infiltrates and destroys the connective tissue of the perineum and scrotum. In rarer instances of inordinate vesical distention, a fall, a sudden movement of the body, or a violent struggle during anesthesia has been known to cause rupture of the bladder.

Long-standing incomplete retention of urine, with spasm of the bladder, is much more serious than the retention which becomes complete in the course of a few weeks, for in the first-named condition the upper urinary organs are often irreparably damaged, and the prognosis is generally unfavorable. It is before the advent of these untoward effects that the greatest good is to be accomplished. Therefore, experienced physicians recommend the early treatment of stricture as preventive of retention of urine and its ill-consequences; but their instructions are seldom followed, and the responsibility rests with all unruly patients who are apt to seek advice at the last moment, when the bladder is distended to its utmost degree and the suffering is more than can be longer endured, even by the most stolid of men, after divers nostrums have been tried and found wanting in efficacy.

It is too common in such cases to resort to cutting operations, which are indicated only after failure of careful catheterism with filiform bougies, or after repeated supra-pubic capillary puncture of the bladder and aspiration of the urine. In ordinary cases it is possible to give prompt relief by making some preliminary dilatation of the stricture; beginning with a No. 1 soft, olive-pointed bougie, and continuing the dilating process by passing successively Nos. 2, 4, 6, and 8, after which it will be easy to use a No. 7 curved web-catheter that serves to allow the urine to flow slowly until about two-thirds of the amount contained in the bladder shall have escaped. The catheter is then plugged at its free extremity, is fastened in position, but is not retained more than thirty-six hours, during which time some urine is drawn off every three hours, and the bladder is finally emptied a few moments before the instrument is withdrawn. After this the stricture is gradually dilated by using bougies of increasing size every third or fourth day until the normal calibre and suppleness of the urethra are restored. Without preliminary dilatation by means of small bougies, it is usually difficult and often impossible to introduce a necessarily small web-catheter, by reason of its undue flexibility as soon as it becomes warmed in the urethra. The insertion of a metallic stylet in a small web-catheter is not prudent, on account of the possibility of perforating the instrument and the urethra, even when the manipulations are carefully and gently conducted.

Any stricture amenable to the method of treatment above described may be regarded as an easy case. The physician is, however, liable to be called to minister to cases that are not manageable with regulation bougies.

The difficult cases are those of very narrow, eccentric, tortuous, dense and resilient strictures, which are accompanied by inordi-

nate spasm of the muscular layers, and are seated in the perineal region of the urethra. A second narrowing in the penile region is generally a troublesome complication which often necessitates internal urethrotomy.

A debauch, in wine or venery, is commonly the excitant of complete retention of urine. In such a case the urethral mucous membrane is likely to be swollen and sensitive, and to bleed freely as soon as a bougie is passed. As a general rule, when catheterism is not deemed expedient, the bladder is punctured above the pubes with a hollow needle, through which the urine is aspirated, and if necessary the operation is repeated until suitable instruments can be used to treat the stricture.

One of the simple and ready methods of entering a narrow stricture whose lumen is eccentric, is by means of a filiform probe-pointed whalebone bougie, elbowed at its extremity. This instrument is used as an explorer of the narrowed canal, and is quickly passed through the stricture in nine out of ten difficult cases, and serves as a conductor for a No. 1 or a No. 2 conical curved steel staff, grooved along its convexity, and having a canal or tunnel two or three millimeters in length, beginning at the blunt point of the instrument and ending in its groove. Through this canal is threaded the bougie, which guides the staff into the stricture, dilating it sufficiently to permit the introduction of a larger tunneled sound, then a third, fourth, fifth, and so on, until divulsion occurs. After this a tunneled catheter is substituted and enough urine is drawn off to relieve the distress caused by distention. The bladder is not completely emptied until the second day. The object of delay in emptying the bladder is to guard against vesical hemorrhage, which is so likely to occur after the sudden withdrawal of all the urine in cases of long-standing distention of the viscus, particularly in elderly men.

It sometimes happens that stricture is so dense that it cannot be dilated by the tunneled sound beyond No. 2 or 3. In that case a tunneled catheter No. 2 or 3 is substituted, and through this instrument the urine may be aspirated if necessary. Then a small web-catheter is passed and fastened in position for forty-eight hours, during which time the urine is allowed to trickle out, partly through and partly beside the instrument. On the third day it is generally possible to carry on dilatation with less difficulty, and, if needed, the process of continuous dilatation may be repeated until the stricture shall admit a bougie of the size of the normal calibre of the urethra. When, however, a stricture seated in the perineal region cannot be entered with any kind of bougie, after repeated trials, it is proper to resort to its external division, with the double object of curing it and of relieving the distended bladder.

For some years past there has been a pernicious fashion of dilating the strictured urethra to an excessive extent, and of using the dilators with undue frequency. In the many cases so treated the consequence has been a total loss of the urethral suppleness, due to subacute urethritis, with extensive infiltration of round cells and their subsequent transformation into scar tissue, so that the canal, although greatly increased in calibre, is in a state of permanent contracture.

Men of dissolute habits seldom return for radical treatment until they are again suffering from retention of urine. Narrow, resilient strictures are not permanently cured by any method of treatment whatsoever, unless the treatment is followed by the persistent use of dilating instruments, once every week or ten days, for at least three years. Some patients need the use of such instruments for many years, if not for life.

WHY IS THE ABDOMEN OPENED IN THE MIDDLE LINE?

RAMSAY (*Lancet*, Nov. 30, 1895) publishes a brief note under this query. In text-books on abdominal operations the linea alba is always recommended as the proper site for the incision, or, in default, the linea semilunaris. From this fact, and from the unanimity of opinion which appears to be held by operators on the subject, one would naturally suppose there must be some great advantage to be obtained from opening the abdomen in one or other of these situations. Inquiry develops the following: (1) Vascularity is low in the middle line, and therefore the hemorrhage is less; (2) there are fewer and less important structures to cut through; and (3) there is greater facility of access to all parts of the abdominal cavity. As regards the first point, this advantage is imaginary and really a disadvantage, for, although the abdominal wall is more vascular in other situations, there is never any hemorrhage in incising it that cannot be easily and speedily controlled, and, moreover, it is this absence of vascularity which tends to delay rapid and permanent healing, and therefore predisposes to hernia. The absence of important structures is also a disadvantage, for the whole

depth of the incision being through tendinous or fibrous layers having a great similarity to one another renders it difficult, especially to young operators, to know exactly the depth of the incision. This is especially the case when there has been inflammatory action. It is difficult to get the layers exactly together again, and they always cohere, so that the depth of the scar when found is barely one-eighth of an inch thick. This is noticed especially when making an incision through the scar of a previous incision. The third point is the only valid argument that can be used in favor of the median incision, and, as the author attempts to show, even this is rather theoretical than practical.

A disadvantage of the median incision is that, should it be necessary to extend it upwards, the umbilicus comes in the way, and as this cannot be rendered aseptic with certainty it has to be avoided and the incision deflected, while some operators remove the umbilicus entirely. This being so, is there any situation in the abdominal wall which offers further advantages without these disadvantages?

The ideal incision for abdominal section is one vertically through the middle of the rectus muscle on either side, and for the following reasons: (1) Although the parts are vascular, there is no hemorrhage; if the epigastric artery is cut, it is easily secured, and this vascularity tends to rapid and efficient healing; (2) there is no injury to the muscle, for after the fascia is divided the muscular fibres are easily separated with a director and retracted; (3) the incision can be made in any part of the muscle and continued up to the ribs or down to the pubes in the same manner; (4) the umbilicus gives rise to no inconvenience; (5) the layers are so well marked that it is impossible with ordinary care to wound the viscera; (6) access to all parts of the abdominal cavity is just as easy as in the middle line (this the writer has found from experience, whilst in some cases, where tubal or ovarian disease is known to be only on one side, it is an advantage to have the incision slightly on that side); (7) the scar left looks as if there had been a skin incision only—it does not pucker or dip in like the ordinary scar, and the separate layers are not coherent; (8) most important of all, if the wound is properly closed the risk of hernia is reduced to the least possible minimum. The best method is to close the wound with silkworm-gut sutures, running through all the layers. These are placed *in situ* and held by forceps; then the peritoneum and posterior layer of fascia are brought together with fine silk sutures, either continuous or interrupted, and then the anterior layer of fascia in the same manner. This brings the muscle firmly together, making the passage through its fibres valvular, restores the natural thickness of the abdominal wall, and prevents coherence of the fascial layers, leaving the abdominal wall in as good a condition as before the operation. Should temporary drainage be essential, necessary sutures should be placed *in situ* and marked with knots. They can then be drawn and tied accurately when the tube is withdrawn. Even if drainage has to be continued for some time, the track running through a thick wall will close better and more firmly and be less likely to give way afterwards.

The author has adopted this incision during the past two months in five cases—viz., two ovariotomies, one tubal gestation, one pelvic abscess, and one cholecystotomy—and has found that these advantages claimed are real and practical. He believes students should be taught that the one place to be avoided in opening the abdomen is the linea alba.

TREATMENT OF MALIGNANT TUMOR.

In a discussion on malignant tumor, held before the New York State Medical Association, SYMS (*New York Medical Journal*, Dec. 21, 1895) advised total removal *en masse* of the growth, together with the surrounding zone of healthy tissue, including the neighboring lymphatic system.

WIEGAN quoted Bull's and Dennis's recent statistics on the radical removal of carcinoma of the breast, which resulted in twenty-five to twenty-six per cent. of the patients passing the three-year limit without a recurrence.

DENNIS called attention to the value of subsequent constitutional treatment and of long surveillance of every patient after operation. He said that but little was to be expected from the administration of constitutional remedies, and where such remedies had been employed after operation, and recurrence had been greatly postponed, the good results should be attributed rather to the radical character of the operation than to the beneficial effect of any specific drug. In a few instances he had known patients with supposed sarcoma to improve marvellously under the administration of iodide of potassium, but it was not impossible that in these cases the tumor had after all been a gumma. Tumors did occasionally disappear

spontaneously, but such instances were extremely rare. As experience had shown that, if recurrence did not take place for three years after an operation, it would only be observed in about two per cent. of the cases, it was fair to make the three-year limit a test of the permanency of the cure. The importance of operating on recurrent growths was shown by reference to a case in which over one hundred cancerous nodules had been removed, and now a considerable time had elapsed since the last recurrence. Every effort should be made to keep these cases under strict surveillance for a long time after extirpation of the growth, in order to be promptly informed of the existence of a recurrence.

COLEY, of New York, read a paper upon the Indications of Non-operative Local Treatment and the Therapeutic Value of Toxins. He presented an analysis of one hundred cases of malignant disease that he had treated with the mixed toxins of erysipelas and the *Bacillus prodigiosus*. In almost every case the diagnosis had been confirmed by adequate microscopical examinations, and most of the cases had been pronounced "inoperable." Of the one hundred cases, sixty-six had been sarcomata, twenty-eight carcinomata, four either sarcoma or carcinoma, and two had first been pronounced sarcoma and afterward proved to be tubercular. In a little over half the sarcoma cases improvement had been shown, particularly in the spindle-cell variety. Out of six patients with melanotic sarcoma, only three had shown even improvement; none had been cured. The results in osteo-sarcoma had been scarcely more satisfactory. All that could be said at present regarding the treatment in carcinomata was that it was very encouraging. To show the permanency of the results in the cases of sarcoma, six patients were presented for examination, some of whom had been cured for three years and over.

Reviews.

TWENTIETH CENTURY PRACTICE AND INTERNATIONAL ENCYCLOPÆDIA OF MODERN MEDICAL SCIENCES. Edited by Thomas L. Stedman, M.D. In twenty volumes. Vol. VI: Diseases of the Respiratory Organs. New York: William Wood & Co., 1896.

We are told by a slip of paper pasted in front of the title-page of this volume that, owing to unforeseen difficulties in the preparation of Vol. V, it has been found necessary to issue Vol. VI out of its regular order, and that Vol. V will be the next one to appear. This also accounts for the lack of sequence in the GAZETTE in the reviews of the various volumes.

The first article in this volume is by Dr. Prosser James, of London; it deals with Diseases of the Nose, in seventy-six pages. We do not find that this article is particularly noteworthy either as to the information which it contains or the manner in which it is written. A better one by far is that by Dr. Jonathan Wright, of Brooklyn, upon Diseases of the Accessory Sinuses of the Nose, which covers thirty pages.

The article upon the Naso-pharynx and Pharynx, by Dr. E. J. Moure, of Bordeaux, is much more exhaustive, as one would naturally expect from the importance of the subject. It covers about 106 pages and is a fair summary of the subject with which it deals, although the illustrations are not as good or as well printed as we could desire. We turn to the article by Dr. Buck, of New York, upon Diseases of the Ear, with considerable interest, because he is so well known to the profession not only as an aurist but also as the editor of encyclopedic works, and we regret to find that under this comprehensive title only about forty-five pages are covered. Perhaps this is all that is necessary, even in so encyclopedic a work, but it recalls to our minds the saying of an old physician that after all otology seemed to consist in the use of a scoop and a powder-blower, and that the results of aural treatment, at least so far as deafness was concerned, were not particularly noteworthy.

The article upon Diseases of the Tonsils is also by Dr. Moure, of Bordeaux, and covers fifty pages. It is a better one than the earlier article which we have mentioned.

By far the best of all these articles dealing with the upper respiratory passages, both from the standpoint of literary ability and from that of scientific scope, is the article by Dr. Bosworth, of New York, upon Diseases of the Larynx. This author utilizes over 150 pages in his usually clear, comprehensive style, so well known to those of the profession who possess his book upon Diseases of the Nose and Throat. Here, again, the illustrations are not as good as they should be in a work possessing so much value and contributed to by such eminent men.

The Diseases of the Trachea and Bronchial Tubes are dealt with by Sir Thomas Grainger Stewart and Dr. George Alexander Gibson, of Edinburgh. Sir Thomas is too well known

as a worker in clinical medicine to require an introduction to American readers, and Dr. Gibson is already well known to many of us by reason of the useful little book on Medical Diagnosis compiled by himself and Dr. Russell. Their article abounds with prescriptions which they have found of value in practice, and the therapeutic portion of their contribution is especially rich, but we note with regret that the editor has not seen to it that information is given concerning the preparations which are official in Great Britain but unofficial in the Pharmacopœia of the United States.

Dr. Winslow Anderson, of San Francisco, concludes the volume with an article on Diseases of the Lungs, excluding croupous pneumonia and tuberculosis.

Taking it all in all, the sixth volume of this Encyclopædia can scarcely be considered the equal of its predecessors in the quality of its contents or in the interest of its articles. There must, however, be some volumes better than others, and we do not wish to give the impression that the present one is not of value. It simply suffers by comparison with its predecessors. In a number of places a little more care in editorial supervision would have been of value. Thus it seems to be the custom, in giving the name of the author on the first page of each article, to also give his place of residence, but in the case of Grainger Stewart and Gibson the place of residence is not indicated.

COLOR-VISION AND COLOR-BLINDNESS. A Practical Manual for Railroad Surgeons. By J. Ellis Jennings, M.D. With illustrations.
Philadelphia: The F. A. Davis Company, publishers, 1896.

This little manual, which opens with a historical sketch of color-blindness, discusses the physiological anatomy of the retina, the physics of light, the theories of color-perception and color-blindness, and the various methods for detecting color-blindness. Holmgren's method, Thomson's adaptation of the colored wools, and Oliver's worsted test, are especially mentioned, and the author has devised a worsted test of his own.

There is one chapter on acquired color-blindness, which comprises a brief description of the disturbances of the color-sense in connection with diseases of the optic nerve and visual centres. There is no mention of those which occur under certain functional conditions, nor of the disturbances of color-sense in neurasthenic and hysteric patients.

The book concludes with the reproduction of the Pennsylvania Railroad Company's instructions for the examination of employés as to vision, color-blindness, and hearing, and a description of Oliver's series of tests for the detection and determination of subnormal color-perception.

Dr. Jennings states very distinctly in his preface that he has not attempted any original work. No doubt his book will be found useful for railroad surgeons. Curiously enough, the two most important works recently published in connection with this subject entirely escape notice, namely, Abney's "Color-Vision" and Mauthner's "Farbenulehre."

G. E. DE S.

THE THERAPEUTICS OF INFANCY AND CHILDHOOD. By A. Jacobi, M.D.
Philadelphia: The J. B. Lippincott Co., 1896.

In the preface of this book, which exemplifies, like the rest of the volume, Dr. Jacobi's characteristic style of writing and speaking, the author tells us he has endeavored to afford to his readers a compact book of the therapeutics of infancy and childhood as viewed by him. As a result a considerable portion of the volume is devoted to the subject of diet and hygiene, as increased experience teaches him year by year the great importance of these remedial influences in the treatment of this class of patients. The endeavor throughout the book has been to make the application of the drugs as rational as possible.

Sixteen chapters make up the volume. The first of these deals with the feeding of sick children; the second with the treatment of the new-born; the third considers general therapeutics; the fourth, fifth and sixth chapters deal with constitutional disorders, infectious diseases, and diseases of the digestive organs; and the remaining chapters discuss diseases of the respiratory organs, the organs of circulation, the nervous system, the skin, the ear, the eye, the muscles, and the bones and joints. Not only has Dr. Jacobi kept himself and his book abreast of recent therapeutic advances, but he adds to the information which he collects from other sources concerning them the value of his own personal experience.

DIET IN SICKNESS AND IN HEALTH. By Mrs. Ernest Hart. With an Introduction by Sir Henry Thompson, F.R.C.S., M.D., London.
Philadelphia: W. B. Saunders, 1895.

This is a book dealing with elementary facts in connection with digestion and diet, and evidently intended chiefly for the guidance of the laity or perhaps of trained nurses

in the feeding of the sick. In this respect it well fulfills its mission. It deals with the various methods of dieting, for increasing or decreasing flesh, and for administration in various ailments, and contains a large number of recipes by which nutritive dishes can be served to invalids. Like many other books of its kind, however, it every now and then "flies the track" and dips more deeply into physiology than is necessary. Thus we hardly think it necessary in a book dealing with digestion and diet, and intended for this class of readers, to have two illustrations showing the glomeruli of the kidney and the uriniferous tubules, with the loops of Henle, and the various other portions of the minute anatomy of the kidney. Some of the pictures also are distinctly diagramatic. The book is one which can be cordially recommended as a useful one to be read by those who have the care of the sick, but it is no better than a number of other works on "Diet" which have been recently published. This one is a small octavo of about 220 pages, including the index.

ENCYKLOPAEDIE DER THERAPIE. Herausgegeben von Oscar Liebreich. Erster Band, II Abtheilung.
Verlag von August Hirschwald. Unter den Linden 68, Berlin, 1896.

In the October number of the GAZETTE we took pleasure in introducing this very valuable contribution of German authors to general medical literature to our readers. This second volume extends from "Auge" to a consideration of the various "Cerates." It consists of about 270 pages, large octavo size. We notice in it interesting articles by Liebreich, Ostertag, Grawitz, Munk, Spiegel, and others equally well known. It will be remembered that the object of this encyclopedia is to present reliable information in regard to both important and unimportant therapeutic subjects, whether it deals with drugs or with other remedial measures. It is the most exhaustive compilation of its kind with which we are acquainted, and the second volume fully maintains not only the reputation of the first, but also that of the distinguished editors.

THE MEDICAL DIGEST, 1840–1890. By Richard Neale, M.D. Third edition. And AN APPENDIX TO THE MEDICAL DIGEST, 1891–1895.
London: Ledger, Smith & Co., 1891 and 1895.

To those who work much in medical literature, these small but comprehensive volumes by Dr. Neale are of the greatest possible value, as they afford a means of readily acquiring information upon the principal contributions to medical science during the last fifty years. It is true that one has to learn the peculiar abbreviations and methods necessary for such great condensation before he can resort to the use of the volume with very satisfactory results, but on the other hand these methods are as simple as the ingenuity of Dr. Neale could devise and are very readily understood and employed after the first few references have been attempted. The amount of labor expended in the preparation of this volume in the first place, and in maintaining it at the high standard reached by Dr. Neale, is simply stupendous and deserves ample recompense from the profession. We cordially recommend these volumes as affording a reliable, useful, and economical method of looking up the literature of any subject which may be of interest, and we trust that Neale's Digest will continue to be for many years to come as useful as it has been in the past.

ANNUAL REPORT OF THE SUPERVISING SURGEON-GENERAL OF THE MARINE HOSPITAL SERVICE OF THE UNITED STATES FOR THE FISCAL YEARS 1893 AND 1894. In two volumes.
Washington: Government Printing Office, 1895.

These Reports are the regular annual contributions of the Surgeon-General of the Marine Hospital Service for 1893 and 1894, and contain information concerning the diseases and emergencies which that Department has had to meet during these periods of time. They form interesting and valuable additions to the Government Records, and year by year store up for us a fund of information in regard to disease.

Correspondence.

LONDON LETTER.

BY ST. CLAIR THOMSON, M.D. LOND., F.R.C.S. ENG., M.R.C.P. LOND.

January 23, 1896.

The mountains are in labor, and we are all on the tiptoe of expectation as to whether the result will be a young giant or only the *ridiculus mus*. In a previous letter I recorded that both of the Royal Colleges, that of the Physicians as well as that of the Surgeons, had refused a petition from the School of Medicine for Women to allow their female students to be admitted to the examinations for diplomas. At the former college, although there are three academic grades amongst the profession connected with it — Licentiates, Members, and Fellows,—the government of the institution is decidedly aristocratic, as

only Fellows are allowed any vote or representation in college affairs. It is a repetition of "*L'état c'est moi*," a sentiment of which history in larger political questions has not endorsed the wisdom. But from the decision of the Fellows there was no appeal. In the College of Surgeons there are only two academic grades—Members and Fellows. Up till recently the former have formed a completely unrepresented constituency, while the Fellows have conducted the work of their *alma mater* by means of a limited number nominated by themselves to seats on the Council. Latterly the Members have secured the privilege of being present twice a year at a meeting of the Fellows in order to bring their wants or grievances before those in authority. It was at one of these meetings that the vote was taken to which I have already referred, and which refused the request for the admission of women. Now comes a curious and interesting part in the evolution of this question. The Fellows have since had a meeting, limited to themselves, and have decided by a large majority that women should be admitted to the examinations for the diploma! It is therefore evident that the rejection of their claims at the previous meeting was entirely due to the presence of the Members—the section generally supposed to be inspired with the most democratic and liberal views. It makes onlookers suspicious that their objection was strongly tinctured with trades-unionism, and certainly their demands for representation on the Council could not have been strengthened by this petty exhibition of either prejudice or jealousy. It says all the more, therefore, for the Fellows that at this same meeting they passed a resolution to the effect that Members should have some representation; the details were left for future consideration, as they could not be worked out in such a large gathering. Those who know anything of the history of John Hunter's college will realize what an enormous innovation is conveyed by these two resolutions. The wise beards of only a generation ago must turn in their graves to think that it is proposed to allow Members to be represented and even to sit at the Councils in Lincoln's Inn Fields, or that women may "go in for the Membership" and perhaps become Fellows!

The next promise of progress comes from the University of London. This institution does no teaching whatsoever; it is simply an examining body, its degrees being open to any one from any country and of any creed. They may study anywhere; the University only sets its hall-mark on them. As this mark is of an exceptionally high standard, a large majority of those who start for this distinction never reach the goal. This is a considerable hardship, and when it is recollected that Scotland, Ireland, and latterly the English provincial towns, have their teaching centres where a student can be taught and can generally depend on securing a degree, the anomaly becomes striking. For some time a movement has been on foot to secure for London a university worthy of her size and position, where the average student should not only be well taught but where he might in the ordinary course count on obtaining the coveted M.D. or M.A. The delay in the execution of this scheme has been the difficulty with regard to the present university. Its graduates are somewhat jealous of its high standard, and do not wish to see that standard lowered. Is there room in London for two universities, one to remain simply an examining body with a high qualification, and the new one to be both for teaching and examining—the latter not to be so very exacting? After much palaver we seem to be approaching the solution of the question in favor of the present university being converted into a teaching body with a modified degree. Some way will be discovered for preserving to present graduates the value of their hard-earned degree. Should this become an accomplished fact, the impetus which will be given to teaching in London will be enormous.

Our two large weekly medical journals have been having a little interchange of editorial amenities which has resulted in the public being made acquainted with their respective circulations. The "issue" of the *British Medical Journal* is 19,500, while the *Lancet* is said to print 10,000 copies weekly. The latter maintains that its "position is now exactly what it has ever been—the highest," and no doubt it is right in affirming that "our circulation is the largest purely medical circulation in the world where the subscribers expect to get nothing whatever in return for their money save their paper." The *British Medical Journal* is of course the journal of an Association and as such is bound to contain a good deal of business notices and reports of unimportant branch meetings. It is, however, remarkable the amount of both news and medical information it contains; the latter must be sought for, especially when it is recollected how unequal must be the produc-

tions of the various members, of whom each one has a semi-right to have his effusions noticed.

This year the annual meeting of the British Medical Association will be held at Carlisle on the 28th, 29th, 30th, and 31st of July. The selection of this Border burgh will give an added interest to the meeting for readers of Walter Scott and of our modern romancers like Stevenson, Crockett, and Ian Maclaren. The proximity to the English Lakes and the Isle of Man will afford many excursions of interest, while the short distance from Liverpool will be convenient to our colleagues from the United States.

Some question having been asked as to the composition of the ointment referred to in your letter from the International Congress of Otology, and recommended by Dr. Daly (Pittsburgh) for chronic eczema of the external ear, I find that it is thus given by Dr. Dundas Grant in the *Journal of Laryngology:*

℞ Hydrarg. ammon. chlor.,
Hydrarg. subchlor., of each gr. j;
Cold cream, ʒ j.

At the same meeting Dr. Adolf Bronner recommended local massage applied with a thick silver probe, tipped with cotton and smeared with the following:

℞ Hydrarg. oxid. flav., gr. x;
Vaselin, ʒ j.

With regard to the operative treatment of cleft palate, some very important points have been emphasized in a lecture given by Mr. Edmund Owen. In many instances, even in hare-lip operations, should suppuration set in, the granulating surfaces may be brought together and a very satisfactory result obtained by secondary union, but it is of exceptional importance to secure primary union in treating cleft palate. The following useful details are therefore well worth remembering: As soon as possible after the operation, the very next day as a rule, the child should be taken into a garden and spend the entire day out of doors. Hence it is well to arrange for operating in the spring or summer. It is to this fresh-air method that Mr. Owen attributes the fact that he gets better results in private practice than in hospitals. Additional points are: attention to carious teeth and to enlarged tonsils and adenoids, if present; the use of silver-wire sutures, not cut too neatly but so as to leave some sharp projections which will prevent the child from thrusting the tip of its tongue into the line of sutures; the importance of not alarming it by insisting too strongly on feeding through the nose or by pressing the use of sprays or mouth-washes; and the preference of water and beef-jelly to milky foods. As to the proper age for operating, the author prefers the first six months for a cleft of the soft palate only, and the second year when both the soft and hard palates are affected.

The treatment of diseases of the heart by the "Schott method"—as the plan of saline baths and resisted exercises is called—appears to be establishing itself. It is now being carried out at Buxton, Llangammarch, Leamington, and other health resorts, as well as in London with artificially prepared baths. These latter can be made by the action of hydrochloric acid on bicarbonate of soda. As a state of chemical purity is not required by the circumstances of the case, the articles of commerce are sufficient for the purpose. Dr. Bezley Thorne gives a receipt for preparing these artificial baths in three strengths according to the degree of effervescence:

Mild: ¼ lb. $NaHCO_3$ to ¾ lb. HCl (twenty-five per cent.).

Medium: 1 lb. $NaHCO_3$ to 1½ lbs. HCl.

Strong (Sprudel strength): 2 lbs. $NaHCO_3$ to 3 lbs. HCl.

The bicarbonate of soda is dissolved in the bath together with a one- to three-per-cent. proportion of chloride of sodium, or crystallized Nauheim bath-salt or sea-salt. If it is desired that the effervescence should take place slowly, the bottle containing the acid is laid at the bottom of the bath, and, the stopper having been withdrawn, it is moved about from time to time. The bath will be ready for use in two or three hours. For the more rapid production of effervescence, the stopper of the bottle containing the acid is loosened but retained in position, the bottle having been inverted and lowered until the mouth is just below the surface of the water; the stopper is then withdrawn, and the bottle is moved about so as to diffuse a layer of acid as uniformly as possible over the surface of the bath. By this means the bath will be prepared in about five minutes.

The resisted exercises can be easily learned from a perusal of Dr. Thorne's monograph, where they are well described and illustrated. (It is published by Messrs. Churchill.)

In mentioning health resorts I am reminded that a handsome volume on "The Climate and Baths of Great Britain" has just been published by the committee nominated by the Medico-Chirurgical Society to report on the subject. It can be obtained from Messrs. Macmillan, New York.

Some cases have been recorded lately tending to show that in permanganate of potash we have a safe and reliable antidote for opium and its chief alkaloid, morphine. In one instance a man swallowed sixteen grains of sulphate of morphine; he was given in all three doses of permanganate solution (five grains in each), and made a rapid recovery. Morphine is well known to be largely excreted by the mucous membrane of the stomach, and the administration of the permanganate unquestionably accelerates its elimination by that organ, the alkaloid being rapidly taken up and oxidized by the permanganate.

At a meeting of the Pathological Society it was recently pointed out that when a goitre has been removed subsequent operations have sometimes to be undertaken for what are supposed to be hypertrophies of accessory thyroids. Most of the speakers did not agree with this explanation of these latter manifestations, and suggested that in opening the primary cystic tumor the wound had become infected, and that from the seeds so implanted these other formations had ensued, the disease being locally but not generally infective. An analogous result takes place when papilliferous cysts of the ovary are ruptured and secondary formations take place on the peritoneum.

To any who are inclined to neglect the mental and nervous element in disease I would recommend the study of an address by Dr. Clouston, the Superintendent of the large Morningside Asylum at Edinburgh. He therein shows "that the brain cortex, and especially the mental cortex, has such a position in the economy that it has to be reckoned with more or less as a factor for good or evil in all diseases of every organ, in all operations, and in all injuries. . . . . We talk and laugh and weep, we blush and shiver, we hunger and sweat, we digest and defecate, all through the brain cortex. . . . It seems as if certain persons who were predisposed to certain diseases have, as their great protective and prophylactic against them, a sound and well-working mind and brain cortex. When well in mind, they are sound in body. When disturbed in mind, they fall victims to their diathesis."

A certain amount of interest and discussion is always raised by reference to the fortunes left by medical men. Amongst those who have died during the past year it appears that Sir William Savory, Surgeon-extraordinary to the Queen, and ex-president of the Royal College of Surgeons, left the goodly sum of £93,190. On the other hand, Dr. J. S. Bristowe, who had a much higher scientific reputation, left only £15,734. The average of the estates left by sixty-seven prominent medical men during the last few years is found to be £50,614, or less than half of that of forty-four lawyers.

February 21, 1896.

It is needless to begin by saying that the question of the hour is the "New Photography," all the various other "new" subjects being temporarily shelved. The Roentgen rays monopolize as much space in our medical journals as they occupy conversation at dinner-tables, while the now well known photograph of the bones of a living hand appears in every magazine and every shop-window. I do not know that any fresh work on the subject has been done here, but the whole matter is thoroughly gone into and new photos given in the March number of *The Practitioner*.

While this "boom" is decidedly in the ascendant, another threatens to have already reached its apogee. I recently referred to the numerous encouraging observations emanating from various sources on the subject of the "Nauheim Treatment of Heart Disease." A decidedly adverse criticism and a salutary note of warning comes from Dr. Herschell in an article in the *Lancet*. He begins by referring to the diagrams with which most of the articles I have quoted are illustrated. These purport to be absolute reproductions, to scale, of the different positions assumed by the upper edge of the cardiac dullness from day to day under the treatment. Many readers have doubtless shared Dr. Herschell's feelings with regard to these diagrams; the first feeling being one of admiration for the skill of the percussor, the next being one of absolute skepticism—not that the *bona fides* of the makers of these diagrams is for one moment impugned, but because they have undoubtedly been unconsciously deceiving themselves. Some cases are recorded to show the uselessness of the baths in valvular heart disease, and it is pointed out that the "movements" imply such possibilities of harm that they require to be most judiciously prescribed. The author limits the Nauheim cure to two classes: the first is formed of cases of functional disturbance for which the treatment is admirably suited, as the patient is made to go through a definite treatment which is

mysteriously modified by the physician according to certain supposed indications in his particular case; the second class comprises the individuals of middle age who eat too much, take too little exercise, and suffer from palpitation and shortness of breath. These cases will be much benefited by any form of gentle exercise, and the movements given by Dr. Schott are perhaps as good as any other to begin with.

Of other recent "booms" the diphtheria antitoxin appears to hold its ground. A valuable observation has been recorded by Dr. Hewlett showing that the specific organism of diphtheria was found in the throat of a patient twenty-three weeks after convalescence; moreover, the virulence of the bacillus was maintained to the end, for a culture of it sufficed to kill a guinea-pig in thirty-six hours. Mr. Butlin has been somewhat adversely criticised for using his position as president of the Pathological Society to question the importance of these virulent bacilli after so long a period. According to Mr. Butlin, there are possibly hundreds or even thousands of persons who harbor similar bacilli without danger to the common weal. This is the *ipse dixit* which is criticised as unwarrantable unless bacteriology is a scientific fad and a delusion.

A cure has been recorded of a case of chronic tetanus treated by Tizzoni's antitoxin. It is unfortunate for the completeness of the record, that there was no bacteriological confirmation of the diagnosis.

To abort acute quinsy (the form which commences on one side of the fauces,—peritonsillar inflammation tending to suppuration) it is recommended to paint the affected tonsil freely with a strong solution of hydrochlorate of cocaine; in most cases this will cut short the attack, and suppuration will not occur. Another writer points out that an equally satisfactory result may be obtained by the administration of an emetic, a method which is thus mentioned in the classic pages of Sir Thomas Watson: "When you catch the disorder at its very onset you may sometimes succeed in cutting it short by an emetic."

I lately came across an attempt to oust the obstetric binder from its apparently permanent position of dignity and comfort. Either alone, or embracing in its folds the family Bible, it has been so long an institution in the chambers sacred to Mrs. Gamp that it will take many an attack to dislodge it from its place in the ritual of the lying-in room. It is pointed out that it only causes congestion, cripples the action of the abdominal muscles, leads to retro-position of the uterus, prevents that organ from being massaged by the play of the abdominal muscles, interferes with the action of the bladder and bowels, makes the patient uncomfortable, and is apt to get soiled and so be a source of septic infection! If dethroned, what will become of the accoucheurs who have been said to owe their reputation in great part to the skill with which they put the binder on?

Yet another family institution is threatened! Mr. Lennox Browne has suggested the abolition of the gargle! As used in the ordinary way, it fails to bring fluids into contact with the posterior wall of the pharynx, and serves almost entirely only as a mouth-wash. The only plan of using it which can have any effect on the parts intended to be reached is that of Von Troelstch. In this a teaspoonful of the liquid is taken in the mouth, the head is thrown back, and while the nose is closed with the fingers the mouth is held open and the movements of swallowing are made without allowing the fluid to pass down the throat. However, the gargle can be very well replaced entirely by sprays, paints, and medicated pastilles.

To the presence of enlarged veins at the base of the tongue—a condition which has been dignified by the name of "lingual varix"—much throat and laryngeal trouble has been attributed by some authors. Dr. Herbert Tilley has entered a plea against this view of things, and is even led to ask: "Does such a condition (*i. e.*, of varicose veins in the region of the lingual tonsil) exist, and, if so, with what frequency?" Naturally he condemns the treatment which, by those who believe in the reality of their pathological postulate, is only too readily adopted, viz., that of cauterizing the veins at the root of the tongue. A sufficient number of cases are on record in which the cautery treatment was followed by acute inflammation of the base of the tongue, so that if the benefit from this method is doubtful the danger is very certain.

As the subject of the dangers of cocaine has recently attracted attention, some practical remarks by Dr. de Havilland Hall are well worth noting. He combines resorcin with cocaine as follows:

℞ Cocaine, 20 Gm.;
Resorcin, 10 Gm.;
Water, 70 Gm.

The addition of resorcin diminishes the toxic effects of cocaine, while it increases the anesthetic effect of the latter and also pre-

vents it from crystallizing out. The antiseptic properties of the resorcin in the solution are also of value. Again, Dr. Hall entirely disapproves of the spray for applying cocaine to the nose. Nearly all the cases he has seen or heard of in which unpleasant effects have followed the use of cocaine have occurred when a spray has been employed. He uses the solution on a cotton applicator, and does not use more than is absolutely necessary. Finally, as antidotes he always keeps at hand some capsules of nitrite of amyl and some ammonia. If the patient becomes pale, giddy, or faint, he is given a drachm of the aromatic spirits of ammonia in two ounces of water, and is directed to sip it slowly. This usually suffices to remove the temporary discomfort; if not, the patient lies down for a few minutes. He has never had occasion to make use of the capsules of nitrite of amyl, and, since employing the double solution of resorcin and cocaine, even the slight toxic symptoms have been of rare occurrence.

I have already written that the annual meeting of the British Medical Association will be held in the old Border city of Carlisle. It is now announced that the number of Sections—which has been gradually increasing—is to be limited to nine. "For this relief, much thanks;" for indeed the subjects of our art had been divided and subdivided until at last the attendance at several Sections had diminished to the officials and a handful of wandering visitors. I note that amongst the absentee Sections this year are those of Therapeutics, Dermatology, Laryngology, and Otology. The absence of the Section of Dermatology is of course more than counterbalanced by the fact that the International Congress on that subject will be held in London early in August, under the presidency of Mr. Jonathan Hutchinson.

Still another medical society! The British Balneological Association has been founded, *inter alia*, to impress on the medical profession and the public that in the United Kingdom are to be found many spas which possess just as much therapeutic value as those located abroad. Unfortunately for the development of British spas, a *Kurgast* is made well not by water alone, but to a very large extent by the brightness, the joyousness, and the many innocent methods of diversion and recreation which are to be found in any Continental health resort, and which are so grimly absent from the "pleasure resorts" (save the mark!) of these Puritanical islands. Until means have been provided, other than those of getting drunk at fixed hours, for the public to enjoy itself harmlessly in the open air, and until the amusement and happiness of the people is looked upon as a civic duty, the Balneological Association will have an up-hill fight.

The employment of bone-marrow in pernicious anemia has been shown by some careful observations of Dr. G. B. Hunt to be of very doubtful benefit. He points out that it is difficult to explain in what way any good effects could be produced by its administration. Two suggestions might be made, corresponding to the two theories that the changes in the bone-marrow found post-mortem are either the result or the cause of the disease. If the first view is taken, that the change in the marrow is due to its over-action in its endeavor to manufacture new red corpuscles, it might be supposed that the marrow which is administered might either help to form new corpuscles or else contain some substance which would act as a stimulant to the blood-forming organs. It would, however, be very difficult to believe that the marrow of an animal taken into the stomach and digested could form new corpuscles, and, as the only tissue which is supposed to form new red corpuscles in the adult—*i. e.*, the red marrow—is already greatly increased, any substance greatly stimulating this tissue to increased action would be useless. If the other view is taken, that the changes in the bone-marrow are in some way the cause of the disease, it might be thought that the administration of marrow extract might supply some deficiency, in the same way as the administration of thyroid-gland extract supplies some deficiency in myxedema. But it is contrary to the general opinion to suppose that the changes in the marrow are the cause of the disease in the same way that the atrophy of the thyroid gland is the supposed cause of the myxedema. Supposing it is the cause, the red marrow in these cases is hypertrophied, not atrophied, so there is no deficiency which can be compensated by giving the extract.

Much attention has been given lately both in our journals and in the debates of our medical societies to the subject of malaria. With regard to the use of quinine as a prophylactic, one writer comes to the conclusion that the administration of even small doses of the drug over a certain period acts injuriously on the red corpuscles, but clinical experience shows that in most cases the injurious effect of quinine, not continued over

too long a time, may be practically ignored. It seems quite certain that most people can take five grains of quinine daily over a very considerable period without any appreciable injurious effect, and for those who stay in malaria-stricken districts and where the malarial parasite is virulent, this dose might be increased. The prophylactic dose should be begun two days before the person is exposed to the action of malaria, and should be continued for ten days after he leaves the district. The solution of the powder is preferred to other forms, and therefore capsules, pills and the various forms of compressed drugs should be eschewed.

Nocturnal incontinence of urine is apt to prove so intractable that the following method of employing electricity is well worth noting: A soft No. 10 rubber catheter is passed into the bladder, and connected by an india-rubber tube to an irrigating tin or other vessel containing a measured quantity of boric-acid lotion. The irrigating tin, insulated by suspension on a piece of drainage-tube, is now raised from one to two feet, and the bladder injected under slight pressure, the amount of fluid injected being carefully measured. On the slightest complaint of pain the tin is at once lowered. As soon as the bladder has received as much fluid as it can comfortably retain, the positive electrode of a constant-current battery is applied over the lumbar spine, and the negative placed in the fluid in the irrigating tin, thus completing the circuit through the column of fluid in the rubber tubes and that distending the bladder. A weak constant current is now allowed to pass for some ten minutes. This is repeated at first every evening for a fortnight, and then at longer intervals. By this method a current of electricity, after passing from the neighborhood of the lumbar cord through the vesical nerves, may be evenly distributed over the walls of the distended bladder.

The above treatment was continued for some months, the applications being repeated once a month, in the case of a woman aged twenty-two, who had suffered since childhood. Not only had all the usual drugs been tried in vain, but also electricity applied in the ordinary method had proved of no avail. At the time the report was made she had remained well for four months.

The fact that the knife is not only a palliative for cancer, but in a majority of cases a cure, is shown by the lectures recently given by Mr. Watson Cheyne. He takes as "cured" any case remaining free of recurrence after three years, and for cancer of the breast his statistics show that these amount to fifty-seven per cent. A very few years ago the proportion was given as little over ten per cent. This remarkable improvement is due to many causes: the realization of the idea that cancer is in the first instance a distinctly local disease; the study of the anatomy of the mamma and of its lymphatics; and the freedom with which—thanks to Lister's teaching—the entire breast can be removed along with a large amount of skin and the contents of the axilla.

On this side of the water we are gradually getting to know the value of certain American M.D.'s The Secretary of the Medical Defense Union has been pointing out in the *Times* that the "University of Philadelphia" *non est.* He states that this so-called university had its charter revoked in 1879 for selling its diplomas to persons who had not followed the prescribed course of studies. The public would be protected and the status of genuine American graduates enhanced if these bogus titles were more systematically exposed.

PARIS.

A few years ago the medical students looked upon their first year of study in the Faculty of Medicine as so much time wasted. It was supposed to be given up to the study of chemistry, physics, and natural history; but in reality the organization of the work was so bad and the examination at the end of the first year so unpractical that it was truly so considered. Two years ago, however, it was decided to transfer the first year of the medical studies under the supervision of the Faculty of Sciences, so that the students would in reality be under the care of instructors specially appointed for the purpose of overseeing the work done and of examining them later on. All students who were not already matriculated were obliged to attend lectures at the Faculty of Sciences, to take notes, which were examined from time to time, and to work in the laboratories of chemistry, physics, and natural history, much more time being given to the practical exercises than had been the case under the former system. Frequent oral examinations of the students were likewise enforced, which was equally new. The examinations at the end of the year were exceptionally difficult, and much stress was laid upon the laboratory notes of the students and their success in the practical examinations. In chemistry such practical work as the following was given:

Preparation of acetate of amyl, or analysis of some compound containing two metals and one acid, or a quantitative analysis. In natural history the student was made to dissect the nervous system of a leech, or do work of a similar nature, and to mount and color botanical histological preparations; to name the families of several plants, no assistance by book being allowed; and finally to determine a certain number of plants with the aid of a Flora.

If the same system be applied, as seems probable, with equal efficacy to the remainder of the medical course in Paris, there is no doubt that the laboratory work in this country will be much improved.

In a discussion which took place recently at the Société Médicale des Hôpitaux, on the accidents to be attributed to the injection of anti-diphtheritic serum, Dr. Chantemesse gave an account of a method he had recently tried with the object of doing away with the inconveniences due to the hypodermic use of the various serums. Dr. Chantemesse practices sero-therapy by means of intestinal injections, and has already a series of twenty cases in which he has been able to convince himself that the absorption of the serum by the mucous membrane of the intestine was attended by no inconveniences. The rectum is first emptied by an ordinary enema, and the serum is then injected by means of a syringe and a medium-sized rubber sound. It does not seem to Dr. Chantemesse that the dose required by this method is larger than when it is administered hypodermically. Three of the cases cited above were diphtheritic, and in these the anti-diphtheritic serum seemed to act with as much efficacy as when a hypodermic injection is made. Marmorek's serum was given in serious cases of erysipelas, and no trouble was experienced as a result of comparatively large doses.

Another method of applying the serum, Dr. Chantemesse finds, diminishes considerably the pain, redness, and tumefaction in erysipelas; it consists in a local application of the serum diluted with five times its weight of lanolin.

Scarlet fever has been treated in the wards of Dr. Josias, of Paris, by the use of Marmorek's anti-streptococcic serum. Ninety-six children were thus treated. The object was to prevent or remove any effects due to the association of the streptococcus with the undiscovered micro-organism which is the cause of the disease. Dr. Marmorek employed doses of ten cubic centimeters each, from ten to twenty cubic centimeters being injected during an ordinary case, and even eighty cubic centimeters being attained in serious cases. Under the influence of the treatment the glandular swellings of the neck, as well as the albuminuria and otorrhea, rapidly disappeared, while the pseudo-membranes of the throat and the delirium were much diminished in cases where they were due to the streptococcus. It is worthy of remark in this connection that scarlet fever is looked upon by some physicians here as a special form of streptococcus infection, the question being whether the streptococcus of erysipelas and the streptococcus of scarlet fever are exactly identical.

Several French surgeons, among whom are Dr. Lejars and Dr. Michaux, have for some time past used intra-venous injections of saline solutions in various surgical emergencies, such as after excessive hemorrhage, after operation for perforation of intestine occurring in enteric fever, or in peritonitis due to various causes. In one case Dr. Michaux performed vaginal hysterectomy upon a woman of thirty-three, and on the third day alarming symptoms developed. An injection of 1200 Cc., and later one of 1500 Cc., were made into the veins of the arm, while the abdomen was opened and the peritoneum thoroughly flushed with warm saline solution. The patient was much ameliorated after two days, and eventually recovered completely.

In some cases enormous doses of liquid have been injected into the veins, Dr. Lejars having attained the amount of twenty-six liters in five days. If during an operation symptoms of collapse manifest themselves, Dr. Lejars gives two or three injections of 100 Cc. each into the subcutaneous tissue of the thigh. The solution usually adopted is Hayem's artificial serum, namely:

Water, 1000 Cc.;
Sodium sulphate, 10 Gm.;
Sodium chloride, 5 Gm.

This is filtered, and boiled for twelve to fifteen minutes in a carefully cleansed glass balloon, of which several are kept on hand filled. The injection is made at the temperature of 38° to 40° C., and the apparatus is so arranged that the outflow is rather slow.

Until a few days ago surgeons serving on French passenger-boats were only required to be graduates of a French university. During the month of January, however, some new sanitary regulations were published by which it will be obligatory for any one wishing to serve in such a capacity to be either

French or naturalized, and to have passed a special examination on subjects referring to sanitary laws and hygiene. Boats provided with a surgeon so appointed, and with the necessary apparatus for disinfection of contaminated objects, will be allowed certain advantages, one of the most important being a reduction in some of the dues payable by them.

A. P. TURNER, M.D. (Paris).

TREATMENT OF PERSISTENT VOMITING OF PREGNANCY.

To the Editors of the THERAPEUTIC GAZETTE:

SIRS:—In December I was called to see a young married woman, twenty-two years old, who was suffering from severe nausea and vomiting. Upon examination I found the uterus hard and about twice its normal size. Patient had missed the last period. I diagnosed pregnancy in the second month, and commenced treatment for the nausea and vomiting. After trying almost everything recommended, for about twenty days, I found that the patient was growing very weak—was unable to move around in bed; pulse was becoming weak and rapid; vomiting occurred every ten or fifteen minutes, and the vomit contained a great deal of mucus, bile, and some blood. I then decided to dilate the cervix with my index finger, which I did, introducing it only to about the first joint. This was about 3 o'clock in the afternoon. Three hours later I returned and found she was resting better. That night she slept well. The next day the nausea and vomiting had entirely ceased, and have not returned.

Yours truly,

CHARLES D. HARRINGTON, M.D.

SLIGO, MISSOURI.

Notes and Queries.

VIVISECTION.

The question of the prohibition of vivisection—which, we know, excites certain people in our own country—has been submitted to the test of popular opinion in a country which governs itself upon communistic principles, and which, therefore, might be expected to give expression to the popular feeling on this subject. A measure for the total prohibition of vivisection was submitted *ad referendum* to the population of the Canton of Schwyz, in Switzerland, with the result that 40,000 votes were against such prohibition, and only 17,000 for it, while a proposal to allow the procedure for scientific purposes was carried by an equally conclusive majority. Apropos of this decision it may be noted that a company has recently been formed in Paris for the purpose of popularizing the Pasteur inoculations. It proposes to erect a hospital in which the inoculation treatment will be made a specialty, and the capital necessary has been subscribed on the moment. It thus appears that all the braying of the anti-vivisection organizations in this country and elsewhere has been attended with no more substantial result than noise, if, indeed, it has not the effect of disgusting the public with such a melancholy exhibition.—*Medical Press and Circular*, Jan. 8, 1896.

WHAT CONSTITUTES A NORMAL ANTITOXIC UNIT?

This is a query often addressed to us by correspondents who confess themselves entirely at sea as to the potency of diphtheria antitoxin. In the following note we shall seek to make perfectly clear the meaning of the normal unit, but no lucidity of explanation can do away with the necessity for a little memorizing.

The first thing to remember is the fact that of a standard toxin or diphtheria virus, 0.1 Cc. is a dose fatal to a guinea-pig of average size.

A normal serum is one possessing such potency that 0.1 Cc. will completely counteract the effects of 1 Cc. toxin; in other words, 0.1 Cc. normal serum will save ten guinea-pigs from the fatal dose.

One cubic centimeter of normal serum will counteract 100 fatal doses, or 10 Cc. of toxin, and this constitutes a normal unit.

One cubic centimeter of our Antitoxin No. 1, possessing a potency of 60 units, will therefore counteract 600 Cc. of standard virus or toxin.

One cubic centimeter of our Antitoxin No. 2 (100 units) will counteract 1000 Cc. toxin.

One cubic centimeter of our Antitoxin No. 3 (150 units) will counteract 1500 Cc. toxin.

For greater clearness, we repeat the foregoing in the form of equations:

0.1 Cc. toxin = fatal dose to medium-sized guinea-pig.
0.1 Cc. normal serum = 1 Cc. toxin, or 10 fatal doses.
1.0 Cc. normal serum = 10 Cc. toxin, or 100 fatal doses, or one normal unit.

The dose (10 Cc.) of our Antitoxins, Nos. 1, 2, and 3, possesses a potency of 600, 1000, and 1500 units, respectively.—PARKE, DAVIS & CO., in *Pharmacal Notes.*

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HUNTER McGUIRE, M.D., LL.D., *President and Professor of Clinical Surgery, University College of Medicine, Richmond, Va.*, says: "**Buffalo Lithia Water,** as an alkaline diuretic, is invaluable. In Uric Acid, Gravel, and indeed, in diseases generally dependent upon **a Uric Acid Diathesis,** it is a remedy of extraordinary potency. I have prescribed it in cases of Rheumatic Gout, which had resisted the ordinary remedies, with wonderfully good results. **I have used it also in my own case,** being a great sufferer from this malady, **and derived more benefit from it than from any other remedy."**

DR. WILLIAM B. TOWLES, *Professor of Anatomy and Materia Medica in the Medical Department of the University of Virginia:* "**Buffalo Lithia Spring** belongs to the Alkaline, or perhaps the Alkaline-Saline Class, for it has proved far more efficacious in many diseased conditions than any of the simple Alkaline waters. I feel no hesitancy whatever in saying that in **Gout, Rheumatic Gout, Rheumatism, Stone in the Bladder,** and in all diseases of **Uric Acid Diathesis,** I know of no remedy at all comparable to it."

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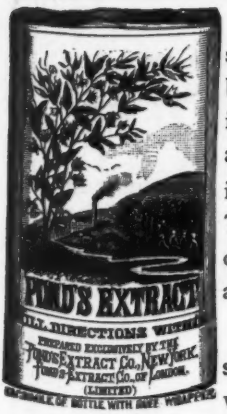

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